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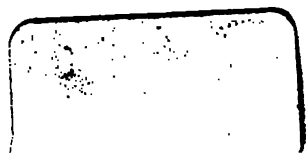
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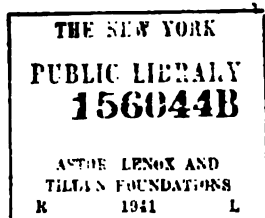


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ANNUAL
FOR
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PREFACE

THIS Volume represents the continuation of the work originally started by the late Professor J. B. Johnson in the Journal of the Association of Engineering Societies in 1884, and turned over by that Association to THE ENGINEERING MAGAZINE at the close of 1895. The previous volumes, published respectively in 1892, 1896, 1901, and 1906, covered with increasing fullness and thoroughness the field of technical engineering periodical literature, and in the present volume every care has been taken to maintain and advance the standard set by its predecessors.

The comprehensive extent of the Index will be seen by an examination of the list of periodicals indexed, these covering 250 technical and engineering journals, in six different languages, about one-fourth of the periodicals indexed being in languages other than English. In every case a brief abstract is given, showing the scope and purport of the article, and in many instances this is sufficient for the purposes of the investigator without further reference. In general, however, the Index is used as a guide to the vast mass of information otherwise practically buried in the numerous files of engineering publications in the reference libraries in all parts of the world, and THE ENGINEERING INDEX thus becomes the master-key by which these storehouses of information may be entered. Thus, the combination of the invaluable technical libraries of the American Institute of Mining Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers in the new engineering building in New York City brings together sets of the leading technical journals of the world through which no individual can find the time or patience to search for all the information which he may desire, but to which he is guided directly and accurately by this volume and its predecessors. The same is true of the libraries of the American Society and of the British Institution of Civil Engineers, of the large universities, and of great public libraries generally.

The latest volume thus brings the investigator down to the close of the year 1906, placing in his hands information which has not yet had time to be incorporated in treatise or text book, while the earlier issues of the Index have, in many instances, enabled searches, such as occur in patent causes and the like, to be prosecuted with a minimum of cost and delay.

TO THE USER

THIS VOLUME of THE ENGINEERING INDEX is "classified" under the great divisions of engineering practice—Civil, Mechanical, Electrical, Mining, etc.—and under these again according to the recognized special divisions of each field. After taking these two long steps in the direction of sorting out the miscellaneous literature of the day into closely allied groups, the arrangement becomes strictly alphabetical in each section. This is identical with the system which has always been followed in THE ENGINEERING INDEX as it is published monthly in THE ENGINEERING MAGAZINE, and it has found wide favor with the Magazine's readers.

The purpose of this plan is to collate, for each specialist, the entire current literature of his subject and to assemble it in a small space where it may readily be found and completely explored. The railway superintendent of motive power, for example, who wants to keep in touch with the latest work done in his department, does not have to plod through all railroad literature alphabetically from "Air-Brake" to "Wreck," looking up every possible word which might title an article of importance to him. He finds them all conveniently gathered into a brief space under the department of Railway Engineering and the sub-head Motive Power and Equipment, and on the adjoining pages before and after he may see everything published during the month on the closely allied subjects of Conducting Transportation and of Permanent Way. It is like running his eye over the shelves of a well arranged library. The literature he wants to know about is all there; perhaps, also, something very important he had not yet heard of, and therefore could not have looked up in an alphabetical list, is brought directly to his notice by this very Classified Index. This is possibly one of the greatest services the Index renders to its regular users.

In the volumes heretofore issued, however, in deference to certain needs of another class of consultants, the arrangement was made strictly alphabetical throughout. While based, like the present volume, upon the monthly parts of THE ENGINEERING INDEX, it required a re-editing of every item, practically equivalent to a rewriting of the entire work. In view of the limited

TO THE USER.

outlet for the book, this undertaking was commercially inexpedient, and professionally a heavy burden of service, which could not be undertaken except at comparatively long intervals. It took about five years to recover from one volume and bring out another. And much of the literature of modern engineering becomes obsolete in five years.

The present annual volume is, therefore, offered as an alternative. By retaining the classification used in *THE ENGINEERING MAGAZINE* it is hoped that it will lighten the labor of reissue to a point more nearly in balance with the returns, and thus insure the permanency of the publication. By annual appearance also, early in each year, it will put its bibliography of current technical literature into the hands of the reader while the matter is still fresh and at its maximum of serviceability, and this should go far to offset the preference for the strict alphabetic arrangement which may still remain with some students. For the classification system is quite simple and easy to work with upon acquaintance.

The "Classification of the Index" facing the first page of the index notes should always be consulted before attempting to look up any given subject. The searcher will decide to which main division and sub-division of engineering the information he seeks logically belongs, and then turn to the page indicated in this "Classification." It will be observed that the catch-words indicating the first and last items on each page run in alphabetical order throughout the division indicated by the running heads to the pages.

Serial articles are indexed upon the appearance of the first instalment only, thus giving the searcher the clue by which the succeeding articles can be found. This rule has been waived in some instances of articles in two or three instalments, which are indexed entire.

When the great number of subjects dealt with is considered, as well as the fact that many important articles include several subjects, it will be realized that the classification has in many instances necessarily been a compromise between conflicting conditions; but it is believed that the system as a whole will serve the great purpose which has always been kept in view, that of guiding the searcher to his destination with a minimum of labor and uncertainty.

REFERENCE LIST OF PERIODICALS

TITLES AND ABBREVIATIONS

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In nearly every instance the abbreviated titles of periodicals indexed will be intelligible without further explanation, but in the following list all the titles are given, together with the addresses, in order that no possible difficulty may appear in the placing of references. The titles are arranged alphabetically in the order of the abbreviations, each being followed by the full title and place of publication. It is to be noted that *w*=weekly; *s.w*=semi-weekly; *m*=monthly; *s.m*=semi-monthly; *b.m*=bi-monthly; *q*=quarterly; *y*=yearly.

- Air Power**—Air Power. *q*. New York.
- Alliance Industrielle**—Alliance Industrielle. *m*. Brussels.
- Am Arch**—American Architect. *w*. New York.
- Am Elect'n**—American Electrician. *m*. New York.
- Am Engr & R R Jour**—American Engineer and Railroad Journal. *m*. New York.
- Am Gas Lgt Jour**—American Gas Light Journal. *w*. New York.
- Am Geol**—American Geologist. *m*. South Bethlehem, Pa.
- Am Jour Sci**—American Journal of Science. *m*. New Haven, Conn.
- Am Mach**—American Machinist. *w*. New York.
- Am Mfr**—American Manufacturer and Iron World. *w*. Pittsburg, Pa.
- Am Shipbuilder**—American Shipbuilder. *w*. New York.
- Am Tel Jour**—American Telephone Journal. *w*. New York.
- Ann d Ponts et Chauss**—Annales des Ponts et Chaussées. *m*. Paris.
- Ann della Societa d Ing e d Arch Ital**—Annali della Società degli Ingegneri e degli Architetti Italiani. *w*. Rome.
- Arch Rev**—Architectural Review. *m*. Boston, Mass.
- Arch't**—Architect. *w*. London.
- Arch't & Build's Mag**—Architect's and Builder's Magazine. *m*. New York.
- Aust Min Stand**—Australian Mining Standard. *w*. Melbourne.
- Autocar**—Autocar. *w*. Coventry, England.
- Auto Jour**—Automotor and Horseless Vehicle Journal. *m*. London.
- Auto Jour**—Automotor Journal. *w*. London. (Successor to the preceding.)
- Auto Mag**—Automobile Magazine. *m*. New York.
- Automobile**—Automobile. *m*. New York.
- Beton und Eisen**—Beton und Eisen. *q*. Vienna.
- Boiler Maker**—Boiler Maker. *m*. New York.
- Brass Wld**—Brass World. *m*. Bridgeport, Conn.
- Br Build**—Brick Builder. *m*. Boston, Mass.

## REFERENCE LIST OF PERIODICALS.

- Bridges**—Bridges. *m.* Chicago.  
**Brit Arch**—British Architect. *w.* London.  
**Brit Columbia Min Rec**—British Columbia Mining Record. *m.* Victoria, B. C.  
**Builder**—Builder. *w.* London.  
**Bull Am Ir & St Assn**—Bulletin of the American Iron and Steel Association. *w.* Philadelphia, Pa.  
**Bull Dept Labor**—Bulletin of Department of Labor. *b.m.* Washington, D. C.  
**Bull Inter Ry Cong**—Bulletin of the International Railway Congress. *m.* Brussels.  
**Bull Sci**—Bulletin Scientifique. *m.* Liège, Belgium.  
**Bull Soc d'Encour**—Bulletin de la Société d'Encouragement. *m.* Paris.  
**Bull Soc Francaise d Ings Coloniaux**—Buletin de la Société Francaise des Ingenieurs Coloniaux. *q.* Paris.  
**Bull Soc Int d'Electriciens**—Bulletin de la Société Internationale d'Electriciens. *m.* Paris.  
**Bull Tech d l Suisse Rom**—Bulletin Technique de la Suisse Romande. *s.m.* Lausanne, Switzerland.  
**Bull Univ Kansas**—Bulletin of the University of Kansas. *b.m.* Lawrence.  
**Bull Univ Wis**—Bulletin of the University of Wisconsin. Madison, Wis.  
  
**Cal Arch**—California Architect. *m.* San Francisco.  
**Cal Jour of Tech**—California Journal of Technology. *m.* Berkeley.  
**Can Arch**—Canadian Architect. *m.* Toronto.  
**Can Elec News**—Canadian Electrical News. *m.* Toronto.  
**Can Eng**—Canadian Engineer. *m.* Toronto and Montreal.  
**Can Min Rev**—Canadian Mining Review. *m.* Montreal.  
**Cassier's Mag**—Cassier's Magazine. *m.* New York and London.  
**Cement**—Cement. *b.m.* New York.  
**Cement Age**—Cement Age. *m.* New York.  
**Central Sta**—Central Station. *m.* New York.  
**Chem & Met Soc of S Africa**—Chemical and Metallurgical Society of South Africa. *m.* Johannesburg.  
**Col Guard**—Colliery Guardian. *w.* London.  
**Compressed Air**—Compressed Air. *m.* New York.  
**Comptes Rendus**—Comptes Rendus de l'Académie des Sciences. *w.* Paris.  
**Con Rev**—Contemporary Review. *m.* London.  
**Cons Repts**—Consular Reports. *m.* Washington, D. C.  
  
**Deutsche Bau**—Deutsche Bauzeitung. *s.w.* Berlin.  
**Dom Eng**—Domestic Engineering. *w.* Chicago.  
  
**Ecl Elec**—Eclairage Electrique. *w.* Paris.  
**Economic Geol**—Economic Geology. *m.* South Bethlehem, Pa.  
**Eisenbahntech Zeitschr**—Eisenbahntechnische Zeitschrift. *b.m.* Berlin.  
**El Arte y la Ciencia**—El Arte y la Ciencia. *m.* City of Mexico.  
**Elec**—Electricity. *w.* New York.  
**Elec Club Jour**—Electric Club Journal. *m.* Pittsburg, Pa.  
**Elec Eng Lond**—Electrical Engineer. *w.* London.  
**Elec Engng**—Electrical Engineering. *m.* Chicago.  
**Elec Jour**—Electric Journal. *m.* Pittsburg, Pa.  
**Elec Lond**—Electricity. *w.* London.  
**Elec Mag**—Electrical Magazine. *m.* London.  
**Elec Paris**—Electricien. *w.* Paris.  
**Elec Ry Rev**—Electric Railway Review. *w.* Chicago.  
**Elec Rev**—Electrical Review. *w.* New York.

## REFERENCE LIST OF PERIODICALS.

- Elec Rev Lond**—Electrical Review. *m.* London.  
**Elec Times**—Electrical Times. *w.* London.  
**Elect'n Lond**—Electrician. *w.* London.  
**Elec Wld & Eng**—Electrical World and Engineer. *w.* New York.  
**Electrochem Ind**—Electrochemical Industry. *m.* New York.  
**Electrochem & Met Ind**—Electrochemical and Metallurgical Industry. *m.* New York.  
**Electrochem & Metallurg**—Electrochemist and Metallurgist. *m.* London.  
**Electrochem Zeitschr**—Elektrochemische Zeitschrift. *m.* Berlin.  
**Elektrizität**—Elektrizität. *s.m.* Leipzig, Germany.  
**Elektrotech u Maschinenbau**—Elektrotechnik und Maschinenbau. *w.* Vienna.  
**Elektrotech Zeitschr**—Elektrotechnische Zeitschrift. *w.* Berlin.  
**Elettricità**—Elettricità. *w.* Milan.  
**Energ Elec**—L'Energie Electrique. *w.* Paris.  
**Eng & Min Jour**—Engineering and Mining Journal. *w.* New York.  
**Eng Mag**—Engineering Magazine. *m.* New York and London.  
**Eng News**—Engineering News. *w.* New York.  
**Engng**—Engineering. *w.* London.  
**Engng-Contr**—Engineering-Contracting. *w.* New York.  
**Eng Rec**—Engineering Record. *w.* New York.  
**Eng Rev**—Engineering Review. *m.* London.  
**Engr Lond**—Engineer. *w.* London.  
**Engr U S A**—Engineer. *s.m.* Chicago.  
**Engs' Gaz**—Engineers' Gazette. *m.* London.  
**Eng Soc W Pa**—Engineers' Society of Western Pennsylvania. *m.* Pittsburg, Pa.  
**Eng Times**—Engineering Times. *m.* London.
- Far East Rev**—Far Eastern Review. *m.* Manila, P. I.  
**Feilden's Mag**—Feilden's Magazine. *m.* London.  
**Fire & Water**—Fire and Water. *w.* New York.  
**Foundry**—Foundry. *m.* Cleveland, O.
- Gas Engrs' Mag**—Gas Engineers' Magazine. *m.* Birmingham, Eng.  
**Gas Wld**—Gas World. *w.* London.  
**Génie Civil**—Génie Civil. *w.* Paris.  
**Gesundheits-Ing**—Gesundheits-Ingenieur. *s.m.* Munich, Bavaria.  
**Giorn dei Lav Pubb e d Str Ferr**—Giornale dei Lavori Pubblici e delle Strade Ferrate.  
*w.* Rome.  
**Glaser's Ann**—Glaser's Annalen für Gewerbe und Bauwesen. *s.m.* Berlin.  
**Glückauf**—Glückauf. *w.* Essen, Germany.
- Heat & Ven**—Heating and Ventilating. *m.* New York.  
**Horseless Age**—Horseless Age. *w.* New York.
- Ice & Refrig**—Ice and Refrigeration. *m.* New York.  
**Ill Zeitschr f Klein- u Strassenbahnen**—Illustrierte Zeitschrift für Klein- und Strassenbahnen. *s.m.* Berlin.  
**Ind & East Eng**—Indian and Eastern Engineer. *m.* Calcutta.  
**Ind & Ir**—Industries and Iron. *w.* London.  
**Industria**—Industria. *w.* Milan.  
**Ind Wld**—Industrial World. *w.* Pittsburg, Pa.  
**Ingenieria**—La Ingenieria. *b.m.* Buenos Aires, Argentina.  
**Ingenieur**—De Ingenieur. *w.* Hague.  
**Inland Arch't**—Inland Architect. *m.* Chicago.

## REFERENCE LIST OF PERIODICALS.

- Ins Engng**—Insurance Engineering. *m.* New York.  
**Int Marine Engng**—International Marine Engineering. *m.* New York.  
**Ir Age**—Iron Age. *w.* New York.  
**Ir & Coal Trds Rev**—Iron and Coal Trades Review. *w.* London.  
**Ir & St Mag**—Iron and Steel Magazine. *m.* Cambridge, Mass.  
**Ir & St Metallurg**—Iron and Steel Metallurgist. *m.* Boston, Mass.  
**Ir & St Trds Jour**—Iron and Steel Trades Journal. *w.* London.  
**Ir Trd Rev**—Iron Trade Review. *w.* Cleveland.  
  
**Jour Am Foundrymen's Assn**—Journal of the American Foundrymen's Association. *m.* New York.  
**Jour Assn Eng Socs**—Journal of the Association of Engineering Societies. *m.* Boston, Mass.  
**Jour Fr Inst**—Journal Franklin Institute. *m.* Philadelphia, Pa.  
**Jour Gas Lgt**—Journal of Gas Lighting. *w.* London.  
**Jour Ir & St Inst**—Journal of the Iron and Steel Institute. *q.* London.  
**Jour N E Water Wks Assn**—Journal of the New England Waterworks Association. *q.* Boston, Mass.  
**Jour of Elec**—Journal of Electricity. *m.* San Francisco, Cal.  
**Jour of Accountancy**—Journal of Accountancy. *m.* New York.  
**Jour Roy Inst of Brit Arch**—Journal of the Royal Institute of British Architects. *s.m.* London.  
**Jour Roy United Service Inst**—Journal Royal United Service Institute. *m.* London.  
**Jour San Inst**—Journal of Sanitary Institute. *q.* London.  
**Jour Soc Arts**—Journal of the Society of Arts. *w.* London.  
**Jour S African Assn of Engs**—Journal of South African Association of Engineers. *m.* Johannesburg.  
**Jour U S Artillery**—Journal of United States Artillery. *b.m.* Fort Monroe, Va.  
**Jour W of Scot Ir & St Inst**—Journal West of Scotland Iron and Steel Institute. *m.* Glasgow.  
**Jour Worcester Poly Inst**—Journal of Worcester Polytechnic Institute. *b.m.* Worcester, Mass.  
**Jour W Soc Engs**—Journal of the Western Society of Engineers. *b.m.* Chicago.  
  
**Locomotive**—Locomotive. *m.* Hartford, Conn.  
**Loc Engng**—Locomotive Engineering. *m.* New York.  
  
**Mach**—Machinery. *m.* New York.  
**Mach Lond**—Machinery. *m.* London.  
**Madrid Cientifico**—Madrid Cientifico. *s.m.* Madrid.  
**Mnfrs Rec**—Manufacturers' Record. *w.* Baltimore.  
**Marine Eng**—Marine Engineer. *m.* London.  
**Marine Engng**—Marine Engineering. *m.* New York.  
**Marine Rev**—Marine Review. *w.* Cleveland, O.  
**Mas St Fit**—Master Steam Fitter. *m.* Chicago.  
**Mech Eng**—Mechanical Engineer. *w.* Manchester, Eng.  
**Mech Wld**—Mechanical World. *w.* London.  
**Mem Soc Ing Civ de France**—Memoires de la Société des Ingenieurs Civils de France. *m.* Paris.  
**Met Work**—Metal Worker. *w.* New York.  
**Metallographist**—Metallographist. *q.* Boston, Mass.  
**Métallurgie**—Métallurgie. *w.* Paris.  
**Min & Met**—Mining and Metallurgy. *s.m.* New York.

## REFERENCE LIST OF PERIODICALS.

- Min & Sci Pr**—Mining and Scientific Press. *w.* San Francisco, Cal.  
**Minero Mex**—Minero Mexicano. *w.* City of Mexico.  
**Minerva**—Minerva. *w.* Rome.  
**Mines & Min**—Mines and Minerals. *m.* Scranton, Pa.  
**Min Jour**—Mining Journal. *w.* London.  
**Min Mag**—Mining Magazine. *m.* New York.  
**Min Rept**—Mining Reporter. *w.* Denver, Colo.  
**Mitt aus d Kgl Tech Versuchsanst**—Mittheilungen aus der Königlich Technischen Versuchsanstalt. Berlin.  
**Mitt d Ver f d Förd d Local u Strassenbahnwesens**—Mittheilungen des Vereines für die Förderung des Local- und Strassenbahnwesens. *m.* Vienna.  
**Mod Mach**—Modern Machinery. *m.* Chicago.  
**Mon d Architectes**—Moniteur des Architectes. *m.* Paris.  
**Monit Indust**—Moniteur Industriel. *w.* Paris.  
**Motor Wagon**—Motor Wagon. *w.* Cleveland, O.  
**Mouvement Maritime**—Mouvement Maritime. *w.* Brussels.  
**Munic Engng**—Municipal Engineering. *m.* Indianapolis, Ind.  
**Munic Jour & Eng**—Municipal Journal and Engineer. *m.* New York.
- N Am Rev**—North American Review. *m.* New York.  
**Nat Bld**—National Builder. *m.* Chicago.  
**Nature**—Nature. *w.* London.  
**Naut Gaz**—Nautical Gazette. *w.* New York.  
**N Z Mines Rec**—New Zealand Mines Record. *m.* Wellington.  
**Nineteenth Cent**—Nineteenth Century. *m.* London.
- Oest Monatschr f d Oeff Baudienst**—Oesterreichische Monatschrift für den öffentlichen Baudienst. *m.* Vienna.  
**Oest Wochenschr f d Oeff Baudienst**—Oesterreichische Wochenschrift für den öffentlichen Baudienst. *w.* Vienna.  
**Oest Zeitschr f Berg- und Hüttenwesen**—Oesterreichische Zeitschrift für Berg- und Hüttenwesen. *w.* Vienna.  
**Ores and Met**—Ores and Metals. *w.* Denver, Colo.
- Pacific Coast Min**—Pacific Coast Miner. *w.* San Francisco, Cal.  
**Page's Mag**—Page's Magazine. *m.* London.  
**Plumb & Dec**—Plumber and Decorator. *m.* London.  
**Pop Sci M**—Popular Science Monthly. *m.* New York.  
**Power**—Power. *m.* New York.  
**Prac Eng**—Practical Engineer. *w.* London.  
**Pro Age**—Progressive Age. *s.m.* New York.  
**Pro Am Soc Civ Engs**—Proceedings of the American Society of Civil Engineers. *m.* New York.  
**Pro Can Soc Civ Engs**—Proceedings of the Canadian Society of Civil Engineers. *m.* Montreal.  
**Pro Engs Club of Phila**—Proceedings Engineers' Club of Philadelphia. *q.* Philadelphia, Pa.  
**Pro Inst Civ Engs**—Proceedings of the Institution of Civil Engineers. *q.* London.  
**Pro Inst Elec Engs**—Proceedings of the Institution of Electrical Engineers. *q.* London.  
**Pro Inst Mech Engs**—Proceedings of the Institution of Mechanical Engineers. London.

REFERENCE LIST OF PERIODICALS.

**Pro Inst Min & Met**—Proceedings of the Institution of Mining and Metallurgy. *m.* London.

**Pro Pac Coast Ry Club**—Proceedings Pacific Coast Railway Club. *m.* San Francisco, Cal.

**Pro St Louis Ry Club**—Proceedings St. Louis Railway Club. *m.* St. Louis, Mo.

**Pro U S Naval Inst**—Proceedings United States Naval Institute. *q.* Annapolis, Md.

**Pub Works**—Public Works. *q.* London.

**Quarry**—Quarry. *m.* London..

**Queensland Gov Min Jour**—Queensland Government Mining Journal. *m.* Brisbane, Australia.

**Rev de Mécanique**—Revue de Mécanique. *m.* Paris.

**Rev de Metallurgie**—Revue de Metallurgie. *m.* Paris.

**Rev d Obras Pub**—Revista de Obras Publicas. *w.* Madrid.

**Revist Tech Ind**—Revista Tecnológico Industrial. *m.* Barcelona, Spain.

**Rev of Revs**—Review of Reviews. *m.* London and New York.

**Rev Tech**—Revue Technique. *s.m.* Paris.

**Revue Gen des Chemin de Fer**—Revue Générale des Chemins de Fer. *m.* Paris.

**Revue Gen des Sci**—Revue Générale des Sciences. *w.* Paris.

**Revue Industrielle**—Revue Industrielle. *w.* Paris.

**Rev Univ des Mines**—Revue Universelle des Mines. *m.* Liège, Belgium.

**Rivista Gen d Ferrovie**—Rivista Generale di Ferrovie. *w.* Florence.

**Rivista Marittima**—Rivista Marittima. *m.* Rome.

**R R Car Jour**—Railroad Car Journal. *m.* New York.

**R R Gaz**—Railroad Gazette. *w.* New York.

**Ry Age**—Railway Age. *w.* Chicago.

**Ry & Engng Rev**—Railway and Engineering Review. *w.* Chicago.

**Ry & Loc Engng**—Railway and Locomotive Engineering. *m.* New York.

**Ry Mag**—Railway Magazine. *m.* New York.

**Ry Mas Mech**—Railway Master Mechanic. *m.* Chicago.

**San Plumb**—Sanitary Plumber. *s.m.* New York.

**Schiffbau**—Schiffbau. *s.m.* Berlin.

**Schw Bauz**—Schweizerische Bauzeitung. *w.* Zürich.

**Sci Am**—Scientific American. *w.* New York.

**Sci Am Sup**—Scientific American Supplement. *w.* New York.

**Sib Jour Engng**—Sibley Journal of Engineering. *m.* Ithaca, N. Y.

**Stahl u Eisen**—Stahl und Eisen. *s.m.* Düsseldorf, Germany.

**Steam Engng**—Steam Engineering. *m.* New York.

**Stevens Ind**—Stevens Institute Indicator. *q.* Hoboken, N. J.

**Stone**—Stone. *m.* New York.

**St Ry Jour**—Street Railway Journal. *w.* New York.

**St Ry Rev**—Street Railway Review. *m.* Chicago.

**Tech Qr**—Technology Quarterly. *q.* Boston, Mass.

**Tech**—Technograph. *yr.* Urbana, Ill.

**Tel Mag**—Telephone Magazine. *m.* Chicago.

**Telephony**—Telephony. *m.* Chicago.

**Tijds v h Kljk Inst v Ing**—Tijdschrift van het Koninklijk Instituut van Ingenieurs.  
*q.* Hague, Holland.

**Tract & Transmission**—Traction and Transmission. *m.* London.



*REFERENCE LIST OF PERIODICALS.*

- Tram & Ry Wld**—Tramway and Railway World. *m.* London.
- Trans Am Inst Elec Eng**s—Transactions American Institute of Electrical Engineers. *m.* New York.
- Trans Am Inst Min Eng**s—Transactions American Institute of Mining Engineers. *m.* New York.
- Trans Am Soc Civ Eng**s—Transactions American Society of Civil Engineers. *m.* New York.
- Trans Am Soc Heat & Ven Eng**s—Transactions American Society of Heating and Ventilating Engineers. New York.
- Trans Am Soc Mech Eng**s—Transactions American Society of Mechanical Engineers. New York.
- Trans Inst Eng & Ship in Scot**—Transactions Institute of Engineers and Shipbuilders in Scotland. Glasgow.
- Transport**—Transport. *w.* London.
- U S Cons Repts**—Consular Reports. *m.* Washington, D. C.
- W Elec**—Western Electrician. *w.* Chicago.
- W Min Wld**—Western Mining World. *w.* Chicago.
- Wiener Bauindust Zeit**—Wiener Bauindustriec Zeitung. *w.* Vienna.
- Wlds Work**—World's Work. *m.* New York.
- Wood Craft**—Wood Craft. *m.* Cleveland, O.
- Yacht**—Le Yacht. *w.* Paris.
- Zentralblatt d Bauverwaltung**—Zentralblatt der Bauverwaltung. *w.* Berlin.
- Zeitschr d Mit Motorwagen Ver**—Zeitschrift des Mitteleuropäischen Motorwagen Vereines. *s.m.* Berlin.
- Zeitschr d Oest Ing u Arch Ver**—Zeitschrift des Oesterreichischen Ingenieur- und Architekten Vereines. *w.* Vienna.
- Zeitschr d Ver Deutscher Ing**—Zeitschrift des Vereines Deutscher Ingenieure. *w.* Berlin.
- Zeitschr f d Gesamte Turbinenwesen**—Zeitschrift für das Gesamte Turbinenwesen. *w.* Munich.
- Zeitschr f Electrochem**—Zeitschrift für Elektrochemie. *w.* Halle a-S., Germany.
- Zeitschr f Elektrotech**—Zeitschrift für Elektrotechnik. *w.* Vienna.

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## 1906

### CIVIL ENGINEERING

#### Abutments

##### Abutments.

The Design of High Abutments. William M. Torrance. Illustrated description of interesting work in connection with double-tracking the Cairo bridge, across the Ohio River; Illinois Central R. R. 3300 w. Eng News—Jan. 11, 1906. No. 74333.

##### Accident.

Displacement of the Semi-Arches of a Stone Bridge. Illustrated description of an accident during erection of the Maximilian bridge at Munich. 2000 w. Engr, Lond—Dec. 29, 1905. No. 74300 A.

##### Anchorage.

Excavating and Concreting the New York Anchorage of the Manhattan Suspension Bridge. Illustrates and describes methods. 2500 w. Eng Rec—March 3, 1906. No. 75404.

#### Arches.

A Graphostatic Examination of Flat Parabolic Arches (Graphostatische Untersuchung des Flachen Parabelgewölbes) Dr. Josef Schreier. A comparison of the graphical and analytical methods of investigating the stresses in masonry arches, taking the parabola as the curve of equilibrium. 3500 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 22, 1905. No. 74618 D.

Computations for a Masonry Arch (Sur le Calcul d'Une Arche en Maçonnerie). M. Auric. Deriving equations for the ready calculations of the stresses in an arch of cycloidal curve. 800 w. Comptes Rendus—Oct. 16, 1905. No. 73325 D.

Masonry Arch of 90 Metres Span (Pont en Maçonnerie de 90 Mètres d'Ouverture). A. Bidault des Chaumes. An illustrated description of the great arch at Plauen, in Saxony, comparing it with the Luxembourg arch. 2000 w. 1 plate. Génie Civil—Nov. 4, 1905. No. 73316 D.

Parabolic Concrete Arch Bridge Over Piney Creek at 16th St., Washington, D. C. Illustrated detailed description of

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a bridge of unusual type. The arch ring has the curve of a parabola and a clear span of 125 ft. 3000 w. Eng News—Nov. 16, 1905. No. 73219.

The Plauen Viaduct. An illustrated description of this viaduct, the arch ring having the largest constructive span ever built in stone. 1700 w. Engr, Lond—Oct. 27, 1905. No. 73011 A.

The New Steel Arch Street Bridge Across the Potomac River, Washington, D. C. Illustrated detailed description of an interesting bridge under construction, at a cost of \$375,000. 2000 w. Eng News—Dec. 21, 1905. No. 73979.

The Plano Arch. John P. Hazen Perry. Illustrated description of the construction of this bridge on the C. B. & Q. R. R., in Illinois. A concrete arch of 75 ft. clear span with wing walls giving a total length of 210 feet. 3000 w. Harvard Engng Jour—Nov., 1905. No. 73742 D.

The Pont de Commerce at Liège (Le Pont de Commerce à Liège). Th. Seyrig. The bridge consists of twin steel voussoir arches, the thrusts at the middle pier balancing each other, leaving only a vertical component. 8000 w. 2 plates. Mem Soc Ing Civ de France—Oct., 1905. No. 73882 G.

Computations for Arches Fixed at the Springings (Note Sur le Calcul des Arcs Encastres). M. Pigeaud. Developing formulas from which working tables are computed, enabling the computations for arches rigidly built into the springings to be made by inspection. 6000 w. Ann d Ponts et Chaussées—2 Trimestre, 1905. No. 75773 E + F.

Computations for Single-Span Arches (Berechnung von Eingespannten Gewölben). E. Mörsch. A mathematical treatment, giving analytical and graphical solutions according to the elastic theory. Two articles. 4000 w. Schweiz Bauzeitung—Feb. 17, 24, 1906. No 75750 each B.

#### Arches

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## Arches

Construction Methods at the Stone Bridge at Hartford, Conn. There are seven elliptical arches of 119 to 68 feet span of cut granite. Details of the centerings and the very effective methods of erection are given. 1500 w. Eng Rec—March 3, 1906. No. 75403.

The Danville Arch Bridge of the Cleveland, Cincinnati, Chicago & St. Louis Railway. An illustrated detailed description of a double-track reinforced concrete bridge of unusual design and its construction. 4300 w. Eng Rec—March 3, 1906. No. 75385.

The Graphical Construction of Parabolas of the Fourth Degree (Tracé Graphique des Paraboles du Quatrième Degré). Farid Boulad. A discussion of the relation of the parabola to the lines of influence of arches, and to the shearing stresses on beams. 7000 w. Ann des Ponts et Chaussées—3 Trimestres, 1905. No. 75775 E + F.

Curves for Reinforced Arches. Daniel B. Luten. Gives illustrations, with explanation, of several methods of design and reinforcement. 1000 w. Eng Rec—April 14, 1906. No. 76317.

"Horseshoe" Concrete Arches. Daniel B. Luten. Illustrations with description of the construction of this type of arch as built on the Indiana railways. 1200 w. R R Gaz—April 20, 1906. No. 76151.

Special Design of Centers for Parabolic Concrete Arch Bridge, Washington, D. C. Shows the method of erection of the arch center of the 16th St. bridge in Washington, D. C. Ills. 600 w. Eng News—April 19, 1906. No. 76133.

The Computation of the Volume of Arches with Inclined Faces (Berechnung des Kubikinhalts von Gewölben mit Schiefem Stirnanzug). Alfred Wessely. Deriving formulas for the calculation of the cubic contents of masonry arches and vaults of semicircular shape with a slope or batter to the external faces. A number of cases are worked out. 3000 w. Zeitschr d Oesterr Ing u Arch Ver—March 16, 1906. No. 76223 D.

The Pennypack Creek Concrete Arch Bridge, P. & R. Ry. Illustrates and describes the construction of a bridge of five semi-circular arches, each of 60 ft. clear span, with an elevation of 80 ft. above low water. 1500 w. Ry & Engng Rev—May 19, 1906. No. 76715.

Three-Hinged Concrete Arch Bridge, Brookside Park, Cleveland, O. H. F. Hackedorn. Illustrates and describes the first three-hinged concrete arch bridge constructed in the United States, which is also the flattest semi-elliptical

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arch ever constructed. 1300 w. Eng News—May 10, 1906. No. 76616.

Arch Construction of the Connecticut Ave. Bridge, Washington. Illustrated description of the method of construction used for the bridge across Rock Creek. 1200 w. Eng Rec—June 2, 1906. No. 77071.

Empirical Formulas for Reinforced Arches. Daniel B. Luten. Discusses a method of empirical design that will enable a designer to lay off all the details of the section for an 80 ft. span in less than an hour's time, yet with great accuracy and efficiency. Ills. 3300 w. Eng Rec—June 28, 1906. No. 77532.

The Bridges over the Iller at Kempten, Allgau, Bavaria (Die Illerbrücken bei Kempten im Allgau). H. Colberg. Describing the construction of two concrete arches of 64.5 metres span, hinged at the crown and spinnings. Illustrations of the centerings and the work in progress are given. Three articles, 4000 w. Deutsche Bauzeitung—April 21, 28, May 2, 1906. No. 77662 each B.

Two Austrian Reinforced Concrete Arch Bridges. Gives two illustrations of ribbed arches with open spandrels, with brief descriptions. 500 w. Eng News—June 21, 1906. No. 77410.

Concrete Arch Bridge on the Queensland State Railways, Degilbo, Queensland. Illustrated description of a concrete arch of 80-ft. span across Deep Creek. 400 w. Eng News—July 19, 1906. No. 78065.

Concrete Arch on the Big Four at Danville. Illustrations taken during construction and after completion of this interesting reinforced concrete bridge, with information. 700 w. R R Gaz—July 13, 1906. No. 77946.

Thickness of the Key in Masonry Arches (Epaisseur à la Clef des Voutes en Maçonnerie). M. Davidesco. Deriving a new formula, adapted to arches of any form, for computing the thickness of the keystone. 2500 w. Ann d Ponts et Chaussées—1 Trimestre, 1906. No. 78136 E + F.

A Four-Span Reinforced-Concrete Arch Bridge on the Southern Railway. H. C. Harrison. The construction of a railroad bridge near Austell, Georgia, is illustrated and described. 4000 w. Eng Rec Sept. 22, 1906. No. 79428.

A Single-Track Reinforced-Concrete Electric Railway Bridge Near Belvidere, Ill. Illustrates and describes the construction of a novel bridge, 350 ft. long, comprising four arches of 81 ft. clear span

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## Austria

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each. 3000 w. St Ry Jour—Sept. 1, 1906. No. 78922 C.

Strauss Ribbed Concrete-Steel Bridge for the Elgin-Belvidere Electric Railroad. Illustrated detailed description of a four-arch bridge near Belvidere, Ill. The concrete arches were cast in suspended forms, without centerings. 3000 w. R R Gaz—Sept. 14, 1906. No. 79192.

New Masonry Bridge over the Loire (Nouveau Pont en Maçonnerie sur la Loire). A. Dumas. Illustrated description of new highway bridge with seven arches of 48 metres span each. Details of centering and construction are given. 4000 w. 1 plate. Génie Civil—Sept. 29, 1906. No. 79911 D.

## Austria.

Austrian Railway Ministerial Order of 28 August, 1904, Concerning Railway Bridges, Over-Bridges, and Approach Road-Bridges, with Iron or Wood Superstructures. Tables. 14000 w. Bul Int Ry Cong—April, 1906. No. 76953 E.

## Bascule.

Strauss Bascul Bridge. Two designs of trunnion bascule bridges are illustrated and described. 800 w. R R Gaz—Voll., No. 11. No. 75553.

New Type of Bascul Bridge. Enos Brown. Illustrates and describes a bridge of the Page bascul type, built at San Francisco. 700 w. Sci Am Sup—April 21, 1906. No. 76136.

Bascul Bridges. An illustrated article describing early and recent types. 2500 w. Ry & Loc Engng—Sept., 1906. No. 78955 C.

A Page Bascul Bridge at San Francisco, Cal. Illustrated description of a drawbridge of the trunnion type, with two leaves. 1500 w. Eng News—May 17, 1906. No. 76680.

## Bay of Fundy

Engulfing a Waterfall. Illustrated description of natural wonders at the Bay of Fundy, and two bridges crossing the St. John river at St. John, New Brunswick. 1400 w. Ry & Loc Engng—July, 1906. No. 77862 C.

## Bengal.

The Damodar Coal-line Bridge: Midnapur-Jherria Extension of the Bengal-Nagpur Railway. William Oswald Taylor. Illustrated detailed description of the construction of a bridge consisting of 5 spans of 150-foot, one span of 100-foot, and one span of 40-foot steel girders, for a single line of rails, on masonry piers. 4200 w. Ills. (No. 3512.) Inst of Civ Engrs. No. 73182 N.

## Bridge Work.

Bay Ridge Improvement Bridges. Outlines the work undertaken in the Bay Ridge improvement for the Long Island railroad, involving an elimination of grade crossings and making of new highways, with about 60 bridges comprising both railroad and highway structures. The types are illustrated and described. 3800 w. Eng Rec—Aug. 18, 1906. No. 78640.

## Buckling.

The Buckling of Spans of Structural Material (Die Knicksicherheit der Stege von Walzwerkprofilen). A. Sommerfeld. An examination of the use of rolled beams for bridges of small span, and the conditions of failure. 2500 w. Zeitschr d Ver Deutscher Ing—July 14, 1906. No. 78702 D.

The Permissible Stresses upon Iron Bridge Members with Reference to their Resistance to Buckling (Zur Frage übe, die Zulässige Inanspruchnahme Eiserner Brückenorgane hinsichtlich des Widerstandes gegen das Zerknicken). Joh. E. Brik. An examination of the buckling stresses in framed structures, deriving formulas and tables for practical use in bridgebuilding. 4000 w. Oesterr Wochenschr f d Deffent Bandienst—March 3, 1906. No 75764 D.

## Cantilever.

Cantilever Bridge of 1800 ft. Span Across the St. Lawrence. Illustrations, with brief description of details of the Quebec bridge. 450 w. Engng—July 6, 1906. No. 77981 A.

Cantilever Bridges. An illustrated article explaining the principle of the cantilever bridge and describing types and modern applications. 2000 w. Ry & Loc Engng—Aug., 1906. No. 78381 C.

The Long Lake Highway Bridge. Describing the design and erection of a steel cantilever highway bridge of 525 feet span across Long Lake, N. Y. Structural details and strain sheets are given. 2000 w. Eng Rec—Sept. 29, 1906. No. 79558.

## Chicago.

A Thirty-three Track Bridge at Chicago. Describes an unusual bridge across 51st St., its constructive details, and careful waterproofing. 1200 w. Eng Rec—June 16, 1906. No. 77337.

Bridges on the 40th St. Line of the Chicago Junction Ry. Illustrates and describes in detail the types of bridges built on this line. 2800 w. Eng Rec—Aug. 25, 1906. No. 78807.

## City Bridges.

Urban Bridges. Willis Whited. Dis-

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## Concrete

cusses points in connection with the design and construction of city bridges, as distinguished from railroad bridges and highway bridges. Also discussion. 6500 w. *Pro Engrs' Soc of W Penn*—Feb., 1906. No. 75091 D.

## Concrete.

Concrete Railroad Bridge at Danville, Illinois. Illustrated description of a concrete arch bridge, of unusual design and considerable size, on the C., C., & St. L. R. R. 1500 w. *Sci Am Sup*—Aug. 11, 1906. No. 78540.

Double-Track and Four-Track Concrete Bridges on the Philadelphia & Reading R. R. Lines. Illustrated detailed description of the construction work of two large concrete bridges. 3500 w. *Eng Rec*—Oct. 13, 1906. No. 79780.

## Curved Trusses.

Computations for Curved Bridges (*Calcul des Ponts Courbes*). M Résal. A discussion of the stresses in bridges in which there is a horizontal curve between piers; with especial reference to the cross strains. 5000 w. *Ann des Ponts et Chaussées*—4 Trimestre, 1905. No. 75780 E + F.

## Denver.

Lawrence Street Bridge, Denver. Illustrated description of a highway bridge 74 feet wide and 156 ft. long, consisting of two plate girder spans skewed 42 degrees 10 minutes with their abutments. 1000 w. *Eng Rec*—Dec. 2, 1905. No. 73575.

## Designs.

Bridges. Willis Whited considers points in bridge designing. General discussion follows. 4800 w. *Pro Engrs Soc of W Penn*—April, 1906. No. 76352 D.

## Diagram.

A Diagram for Bridge Laterals. O. W. Childs. Gives a diagram designed to enable one to read off the proper size of lateral rod for any panel of any length and roadway within the limits for which the diagram is constructed, explaining its use. 400 w. *Eng News*—June 21, 1906. No. 77414.

## Drawbridge.

A Temporary Wooden Drawbridge. Illustrates and describes a bridge built over the Chicago River at Chicago, to carry highway and street railway traffic during the building of permanent bascule bridges. 1200 w. *Eng Rec*—June 9, 1906. No. 77236.

A Temporary Bridge with Pontoon Draw Span Over the Chicago River. Illustrates and describes an interesting temporary structure near 22nd St., Chicago.

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## Erection

It is a pile trestle with a swing span having one end supported by pivot on the fixed work, and the other end supported by a fixed bearing when closed and by a pontoon when swinging. 900 w. *Eng News*—Dec. 28, 1905. No. 74034.

Replacing the Broadway Drawbridge with a New Span. Describes and illustrates interesting engineering methods used in transferring the old Broadway drawbridge over the Harlem ship canal to its new position, and the subsequent placing of the new span, made necessary to accommodate an extension of the Subway across the Harlem River. 700 w. *Sci Am*—June 30, 1906. No. 77709.

The Motive Power Arrangements of the New Railway Bridge over the North-Sea Canal at Velsen (*Die Bewegungseinrichtungen des Neuen Eisenbahnbrücke über den Nordsee-Kanal bei Velsen*). J. J. W. van Loenen-Martinet & F. C. Dufour. The bridge spans the Amsterdam-North Sea Canal for the railway between Haarlem and North Holland. The paper discusses the electric power arrangements for operating the large draw. 4000 w. *Zeitsche d Ver Deutscher Ing*—June 30, 1906. No. 78106 D.

A Center Bearing 284 ft. Double Track Draw Span. Illustrates and describes details of a drawbridge crossing the Elizabeth River at Norfolk, Va. 1000 w. *Eng Rec*—Aug. 11, 1906. No. 78497.

The Herren Bridge at Lubeck (*Die Herrenbrücke bei Lübeck*). C. Buzeman. Illustrating and describing a double swing bridge of 50 metres opening over the mouth of the Trave at Lübeck, with details of the swing mechanism. 5000 w. *Zeitschr d Ver Deutscher Ing*—July 14, 1906. No. 78700 D.

Trunnion Bridge for W. & L. E. R. R. at Cleveland. A fully illustrated description of an improved type of lift drawbridge, with trunnion supports and counterbalanced leaves—replacing an old swing railroad bridge over the Cuyahoga river. 2500 w. *Ry & Engng Rev*—Dec. 16, 1905. No. 73783.

## Erection.

Erecting the Floor Systems and Lower Part of Trusses, Island Span, Blackwell's Island Bridge, New York. Illustrated detailed description of the sequence of operations. 1500 w. *Eng Rec*—March 17, 1906. No. 75571.

Erection of the Upper Part of the Trusses of the Island Span of Blackwell's Island Bridge, New York. Illus-

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trated description of the work. 2200 w. Eng Rec—March, 3, 1906. No. 75399.

The Erection of the Miramichi Bridge. A truss bridge for the Intercolonial Railway across the southwest branch of the river, above Newcastle, New Brunswick. Six 204 ft. spans on stone piers. Completed spans floated into place in pairs on scows. 1300 w. Eng Rec—March 24, 1906. No. 75685.

## Eye-Bars.

New Facts About Eye-Bars. Theodore Cooper. States some incorrect assumptions that are generally accepted, describes an investigation carried out in connection with the erection of the Quebec Bridge, giving tabulated results, with their practical consideration and application. 4000 w. Pro Am Soc of Civ Engrs—Jan., 1906. No. 74702 E.

New Facts About Eye-Bars. Discussion of paper on this subject, by Theodore Cooper. Ills. 3800 w. Pro Am Soc of Civ Engrs—April, 1906—No. 76394 E.

## Falsework.

Steel Falsework Used in the Erection of the Quebec Bridge. Illustrated description of the falsework with information concerning the erection. 1800 w. Eng Rec—Sept. 8, 1906. No. 79030.

## Floors.

Proposed Concrete Floors for Railway Bridges and Tracks. J. W. Schaub. Illustrates and describes a proposed design in which the track rests on a longitudinal timber bolted to a concrete floor. 1000 w. Eng News—Nov. 2, 1905. No. 72959.

Tests of Metal Floors (Epreuves des Tabliers Métalliques). M. Garau. Data and results of tests of the floors of bridges on the railway between Quillan and Rivesaltes, in the French Pyrenees. 10000 w. 4 plates. Ann d Ponts et Chaussées—1 Trimestre, 1906. No. 78-134 E + F.

## Foot-Bridge.

A Novel Foot-Bridge. Illustrated description of a bridge at Cedar Rapids, Iowa, over three railroads which are side by side at this point. It is a riveted steel girder bridge with concrete piers, reinforced concrete floor and stairways, and a concrete protective covering for the steel work. 600 w. R R Gaz—Aug. 3, 1906. No. 78415.

## Girders.

Girder Renewals, N. W. R., India. G. H. List. Illustrated account of heavy girder renewals under traffic on a single line. 800 w. Engr, Lond—Feb. 9, 1906. Serial. 1st part. No. 75069 A.

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## Iron Bridges

The Most Efficient Depth of Parallel Girders (Beitrag zur Theorie der Günstigsten Trägerhöhe des Parallelträgers). F. Gebauer. A mathematical examination of the strength of lattice girders, deriving formulas for the most efficient distance between chords. Three articles. 10000 w. Zeitschr d Oesterr Ing u Arch Ver—June 29, July 6, 13, 1906. No. 78159 each D.

## Girder Bearings.

Standard Bearings for Long-Span Plate Girder Bridges, Chicago, Milwaukee & St. Paul Ry. Illustrates and describes the character of the end bearings used. 1200 w. Eng Rec—Dec. 9, 1905. No. 73676.

## Havre-de-Grace.

The Pennsylvania Railroad Bridge at Havre-de-Grace, Md. Illustrated description of a steel bridge under construction across the Susquehanna River, which represents the most advanced methods. 3000 w. Eng Rec—April 28, 1906. No. 76414.

## Highway Bridge.

The New Portland Bridge. H. A. Crafts. Replacing an old bridge across the Willamette River, Portland, Oregon. One 200 ft. skew span, two 269 ft. common span, and a 384 ft. draw span, all steel trusses. Some difficult work with pile foundations for piers is discussed. 1000 w. Eng Rec—March 3, 1906. No. 75391.

## High-Level.

Four-Track Deck Bridge Over the Tyne at Newcastle, England. Illustrates a new high-level bridge with brief description of its design and construction. 1100 w. Eng News—Sept. 6, 1906. No. 79088.

## Hungary.

The Bridge over the March at Hradisch (Die Marchbrücke in Ungarisch-Hradisch). A. Hawranek. A detailed account of the braced arch of 76.8 metres span with strain sheets and structural data. Three articles. 8000 w. Zeitschr d Oesterr Ing u Arch Ver—Sept. 28, Oct. 5, 12, 1906. No. 79933, each D.

## Iron Bridges.

Buildwas Bridge. An interesting account of the first two iron bridges of the world, built in the Severn valley; with special description and illustrations of this bridge built in 1796, and now being demolished, and to be replaced by a bow-string lattice girder structure of the same span. 1500 w. Engr, Lond—Feb. 2, 1906. No. 75000 A.



# CIVIL ENGINEERING

## Lattice-Girder

### Lattice-Girder.

The Determination of the Stresses in Lattice-Girder Bridges when Subjected to Concentrated Travelling-Loads, and the Effect of Replacing These Loads by "Equivalent Loads." Frederick Charles Lea. Discusses a simple but accurate method of determining these stresses, considering a number of special cases. Ills. 8200 w. (No. 3539.) Inst of Civ Engrs. No. 73172 N.

### Liege.

The Bridge of Commerce, Liège. Illustrated description of the new bridge over the river Meuse. 3000 w. Engr, Lond—July 20, 1906. No. 78315 A.

### Loads.

Uniform Live Loads for Railroad Bridges, and Shearing Stress in Webs of Plate Girders. A. W. Buel. Reprinted from Bul. No. 75 of the Am. Ry. Engng. & Main. of Way Assn. Offers a suggestion as a substitute for the system of live loads usually used, and gives a diagram showing graphically several formulas for shear in plate girder webs and spacing of stiffeners. 1200 w. R R Gaz—Aug. 10, 1906. No. 78523.

Equivalent Uniform Live Loads for Railroad Bridge Trusses. J. E. Kirkham. Gives a method for determining uniform loads equivalent to the typical wheel loads specified by the railroads. 1000 w. Eng News—Sept. 13, 1906. No. 79171.

Maximum Bridge Stresses Under Live Load. R. M. Packard. An explanation of the standards for maximum bending moment and shear under moving loads, and the circumstances under which they are satisfied. 1500 w. Eng Rec—Sept. 8, 1906. No. 79039.

Moving Loads on Railway Under-Bridges. H. Bamford. Graphical determination of the maximum bending moment and maximum shear due to a train-load. 2200 w. Engng—Sept. 7, 1906. Serial. 1st part. No. 79232 A.

### London Bridge.

The Widening of London Bridge. William Bartholomew Cole. Reviews the various movements for widening this bridge, which was opened in 1831, and the final work of widening the footways. Ills. 8500 w. (No. 3518.) Inst of Civ Engrs. No. 73171 N.

### Maintenance.

The Strengthening and Maintenance of Early Iron Bridges. William Marriott. From Proceedings of the Inst. of Civ. Engrs., with discussion and correspondence. Considers especially the West

## BRIDGES

## New York

Lynn bridge over the River Ouse, and the Potter Heigham bridge, over the River Thurne. Tables and Ills. 17000 w. Bul Int Ry Cong—April, 1906. No. 76952 E.

### Memorial.

The Hendrick Hudson Memorial Bridge. Illustration and information of a proposed bridge to span the Harlem River where it connects with the Hudson, to be built in commemoration of the tercentennial of the discovery of the Hudson River. 1200 w. Sci Am—May 5, 1906. No. 76498.

### Missouri River.

New Bismarck Bridge of the Northern Pacific. Illustrated description of a new bridge in North Dakota, built to replace one too light for present traffic. 800 w. R R Gaz—Vol. XI, No. 8. No. 75238.

Reconstruction of the Bismarck Bridge. Illustrated detailed description of the method of construction of a single-track bridge on the Northern Pacific Railway. 2500 w. Eng Rec—Feb. 24, 1906. No. 75264.

### Model.

The Construction of a Bridge Model. Jarvis A. Marikle. Half-tones and description of a model of a portion of a double track cantilever bridge, at Pittsburgh. 2000 w. Mach, N Y—July, 1906. No. 77700 C.

### Newcastle-on-Tyne.

The New Railway Bridge at Newcastle. The new high-level bridge of the North-Eastern Ry. Co., over the River Tyne, connecting Gateshead and Newcastle, is illustrated and described. 2500 w. Engr, Lond—May 25, 1906. Serial. 1st part. No. 77147 A.

Electrical Plant at the King Edward Bridge, Newcastle-on-Tyne. Brief illustrated description of this bridge and of the electrical plant utilized in its construction. 2000 w. Elec Rev, Lond—Aug. 17, 1906. No. 78843 A.

### New York.

Williamsburg Bridge, New York. Frank W. Skinner. Illustrated description of this bridge and its construction, explaining the location and conditions and briefly describing the companion bridges. 6000 w. Engng—Oct. 18, 1905. Serial. 1st part. No. 73007 A.

Terminals of the Manhattan Bridge. Outlines the general design of the bridge and illustrates both terminals. 600 w. R R Gaz—Vol. XXXIX, No. 22. No. 73514.

The New Manhattan Bridge. W. S.

# CIVIL ENGINEERING

## Nile

Crandall. Illustrated description of the fourth bridge to be built across the East Island. 1800 w. Munic Eng—June, 1906. No. 77303 C.

The Upper Sections of the Manhattan Bridge Towers. Illustrates and describes details of towers, the scheme of horizontal bracing, &c., of the Manhattan bridge in New York City. 1000 w. Eng Rec—Dec. 2, 1905. No. 73571.

Main Vertical and Inclined Posts, Island Span, Blackwell's Island Bridge. Illustrated description of interesting details in the construction of this bridge across the East River, at New York City. 1500 w. Eng Rec—Jan. 27, 1906. No. 74769.

The Lower Chords of the Island Span of the Blackwell's Island Bridge. Illustrated description of the riveted bottom chords of the island span of the bridge across the East river at Blackwell's Island, New York City. 1200 w. Eng Rec—Jan. 6, 1906. No. 74274.

Erection of Falsework and Pier Pedestals, Island Span, Blackwell's Island Bridge. Illustrated description. 1400 w. Eng Rec—Feb. 24, 1906. No. 75260.

Secondary Members of the Island Span of the Blackwell's Island Bridge, New York. Illustrates and describes the design. 1600 w. Eng Rec—Feb. 10, 1906. No. 74976.

Progress in the Blackwell's Island Bridge. An illustrated description of the erection of the superstructure for the island span of this bridge across the East River at New York City. 3000 w. Eng Rec—Sept. 15, 1906. No. 79157.

## Nile.

The Nile Bridge at Cairo. Illustrations, with description of the construction work. 1000 w. Engng—Jan. 12, 1906. No. 74522 A.

The Nile Bridge at Cairo. Photographs and progress diagrams with an account of the work so far as executed. 2000 w. Engng—Oct. 12, 1906. No. 80055 A.

## Oklahoma.

South Canadian River Bridge of the Kansas City, Mexico, and Orient. Illustrated description of the construction of a bridge built of steel on concrete piers for the south half, and of a pile trestle to be replaced later by a permanent structure for the north half. 600 w. Ry Age—Aug. 17, 1906. No. 78654.

## Overloads.

Concerning the Investigation of Overloaded Bridges. William J. Watson. Discusses the great discrepancy between theory and observed results, and points concerning the design of new work and the investigation of old work. 3000 w.

## BRIDGES

## Quebec

Pro Am Soc of Civ Engrs—April, 1906. No. 76392 E.

## Paris.

The Austerlitz Bridge Across the Seine for the Metropolitan Railway of Paris. René Bonnin. States the conditions to be met and gives an illustrated description of the plan adopted, and method of erection. 4000 w. Eng News—Dec. 7, 1905. No. 73627.

## Plate Girders.

Standard Plate Girders on the Chicago, Milwaukee & St. Paul Ry. Illustrated detailed description of the girders for shallow floor through plate girder bridges. 1800 w. Eng Rec—Jan. 20, 1906. No. 74501.

The Design of Plate Girders. Presents a rational order of procedure in designing such bridges, discussing details. 3000 w. Engr, Lond—Aug. 24, 1906. No. 79016 A.

## Prague.

A Critical Study of the Competitive Designs for a Bridge over the Moldau at Prague (Kritische Betrachtungen über den Wettbewerb für eine Moldaubrücke beim Rudolfinum in Prag). W. Plenkner. With sketches of the seven designs submitted, computations of the stresses, and a comparison of estimated costs. 7500 w. Oesterr Wochenschr f d Oeffent Baudienst—May\* 19, 1906. No. 77620 D.

## Portland, Ore.

The New Morrison Street Bridge, Portland, Oregon. H. A. Crafts. Illustrated detailed description of the construction of a large bridge with a 384-foot draw span. The work had to be carried on without interruption of the heavy traffic or of navigation. 800 w. Sci Am Sup—Sept. 22, 1906. No. 79289.

## Poughkeepsie.

Reinforcing the Poughkeepsie Bridge. Describes the high-level, double-track deck structure across the Hudson River, completed about 20 years ago, and the improvements to be made to meet present requirements. 1700 w. Eng Rec—Oct. 28, 1905. No. 72906.

## Quebec.

The Progress of the Quebec Bridge. An illustrated report of the work on this bridge across the St. Lawrence River. 3000 w. Eng Rec—June 23, 1906. No. 77430.

Camber Adjustments Made in the Erection of the Quebec Bridge. Illustrates and describes unusual construction to meet severe requirements. 800 w. Eng Rec—Sept. 15, 1906. No. 79161.

# CIVIL ENGINEERING

## Railway Bridges

The Erection of the Quebec Bridge. Illustrates and describes interesting features in this highway and railroad bridge across the St. Lawrence River—the longest span bridge ever built. 1300 w. Sci Am—Sept. 29, 1906. No. 79499.

## Railway Bridges.

Some Notable American Railway Bridges. James G. Walton. Illustrates and describes recently erected examples of steel bridge building as practiced in the United States. 100 w. Cassier's Mag—Jan., 1906. No. 74461 B.

## Raising.

Raising of Canal Bridge at Schenectady, New York. Illustrates and describes the methods used in raising a modified Pratt, through riveted truss bridge of 162-ft. span, built on a skew of 35 degrees, and carrying four tracks. 1800 w. R R Gaz—Sept. 21, 1906. No. 79403.

## Reconstruction.

The Reconstruction of the Susquehanna River Bridge. An illustrated description of the methods used in replacing a single track bridge at Brown's, Pa., by a double-track plate-girder. The method of erection was novel and interesting, designed to suit the difficult conditions. 2500 w. Eng Rec—July 28, 1906. No. 78276.

Derrick Cars Used in the Reconstruction of the Poughkeepsie Bridge. Illustrated description of cars for special service which proved of great value in difficult construction work. 1500 w. Eng Rec—Aug. 25, 1906. No. 78810.

Replacing Viaduct Girders in the Reconstruction of the Poughkeepsie Bridge. Illustrates and describes difficult work in bridge engineering. The great height of this structure across the Hudson River, and the necessity of uninterrupted train service added to the difficulties. 2000 w. Eng Rec—Aug. 18, 1906. No. 78638.

Reconstructing the Piers of a Double-Track Railroad Bridge. An illustrated article explaining the conditions and describing work at Schenectady, N. Y. 1400 w. Eng Rec—Oct. 6, 1906. No. 79671.

Rebuilding the Housatonic River Bridge of the New York, New Haven & Hartford at Sandy Hook, Conn. Extract from a paper by A. H. Terry, before the Conn. Soc. of Civ. Engrs. on speed of constructions as illustrated by methods employed in replacing Bridge No. 105. Ills. 1800 w. R R Gaz—Vol. XL., No. 13. No. 75836.

## Reinforced Concrete.

Reinforced - Concrete Bridges with

## BRIDGES

## Reinforced Concrete

Gravel Roadway (Betoneisenbrücken für Beschottete Strassen). Anton Kraupa. Illustrating arrangements of structural beams imbedded in concrete and carrying highways. Computations for various loadings are given. 2000 w. Oesterr Wochenschr f d Oeffent Baudienst—Oct. 28, 1905. No. 73365 D.

The Pollasky Reinforced Concrete Bridge. Illustrated description of a recently completed bridge in California, which is one of the largest reinforced concrete bridges in the country. 1000 w. Eng Rec—Feb. 24, 1906. No. 75263.

Arch Rib Bridge of Reinforced Concrete at Grand Rapids, Mich. George Jacob Davis. A type unusual in the United States, having reinforced slabs imbedded in the haunches, forming a pair of cantilevers. 2000 w. Eng News—March 22, 1906. No. 75647.

Ferro-Concrete Viaduct at Gennevilliers, near Paris. Illustrates and describes a viaduct erected to carry the branch of railway connecting the new gas works with a quay. It consists of 22 spans. 1000 w. Engng—Feb. 23, 1906. No. 75372 A.

Parabolic Reinforced Concrete Arch Bridge at Wabash, Ind. Illustrated description of a highway bridge having a rather unusual curve of the arch ring, a parabolic arc, and very complete reinforcement of the spandrel walls. 400 w. Eng News—March 15, 1906. No. 75527.

The Third Street Reinforced Concrete Bridge, Dayton, Ohio. Illustrated detailed description of the construction of a seven-span bridge on the Melan arch system. 2500 w. Eng Rec—March 24, 1906. No. 75682.

A Flat Span Reinforced Concrete Bridge at Memphis. A highway bridge of 100 ft. through span is illustrated and described. The cost was \$17,500. 1100 w. Eng Rec—April, 1906. No. 75983.

Reinforced Concrete Arch Bridge at Peru, Indiana. Daniel B. Luten. Illustrates one of the longest reinforced-concrete bridges ever erected. It crosses the Wabash River with seven arches. 2500 w. Eng News—March 29, 1906. No. 75863.

A "Double-Drum" Reinforced Concrete Arch Highway Bridge. Daniel B. Luten. An unusual design at Muncie, Ind., is illustrated and described. 1200 w. Eng News—May 3, 1906. No. 76477.

A Reinforced Concrete Girder Highway Bridge of 40 Ft. Span. Daniel B. Luten. Illustrates and describes a new bridge built on abutments considered suf-

# CIVIL ENGINEERING

## Reinforced Concrete

ficiently good, which had formerly supported a wooden truss. 2000 w. Eng News—May 10, 1906. No. 76620.

**Reinforced Concrete Highway Bridges on the Big Four.** Illustrates two interesting designs in Illinois, describing details. 500 w. R R Gaz—May 18, 1906. No. 76745.

**Reinforced Concrete Trestlework Viaduct for a Spanish Mineral Railway.** Brief description, with illustrations, of two trestlework viaducts near Seville, Spain, and also of an ore-loading pier. 600 w. Eng News—May 17, 1906. No. 76675.

**Short Span Concrete Bridges on the Long Island Railroad.** Reinforced-concrete structures designed to carry the heaviest trains and locomotives at high speed are described. Ills. 1200 w. Eng Rec—May 19, 1906. No. 76739.

**A Reinforced Concrete Arch Bridge Built in Reinforced Concrete Forms Without Centering.** Illustrated description of the design and erection of this bridge near Belvidere, Ill. 3000 w. Eng News—Aug., 1906. No. 78895.

**I. Jefferson Street Bridge, South Bend, Indiana.** A. J. Hammond. II. Construction of Jefferson Street Bridge, South Bend, Indiana. O. E. Strehlow. Two papers discussed together. The removal of the old bridge and the construction of the new reinforced concrete bridge are described. Ills. 5500 w. Jour W Soc of Engrs—Aug., 1906. No. 78894 D.

**Jefferson Street Bridge, South Bend, Ind.** Illustrates and describes a reinforced-concrete monumental arch bridge, having a total length of 554 ft. 4000 w. Eng Rec—July 28, 1906. No. 78273.

**The Chauderon-Montbenon Reinforced Concrete Bridge at Lausanne** (Die Beton-Eisen Brücke Chauderon-Montbenon in Lausanne). J. Melan. Full details of the high-level viaduct recently constructed at Lausanne, with strain sheets for the arches, and details of the centerings. 5000 w. 3 plates. Zeitschr d Oesterr Ing u Arch Ver—June 1, 1906. No. 77616 D.

**Reinforced Concrete Bridge on East Washington Street, Indianapolis, Ind.** D. B. Luten. Illustrated description of an arch bridge reinforced wholly with smooth steel rods, and its method of construction. 1500 w. Munic Engng—July, 1906. No. 78036 C.

See also Civil Engineering, Construction.

## BRIDGES

### Removal.

**The Removal of the Passy Bridge** (Déplacement de la Passerelle de Passy). L. Biette. Describing the manner in which a bridge across the Seine at Paris was shifted bodily 29 metres from its original position. 5000 w. 2 plates. Am d Ponts et Chaussées—2 Trimestre, 1906. No. 79332 E+F.

### Replacement.

**The Replacement of the Broadway Bridge Over the Harlem Ship Canal.** An illustrated description of methods used in this work, which was effected without serious interruption of traffic. The old superstructure was removed to a new site, and a new double-deck structure put in its place. 3000 w. Eng Rec—Aug 4, 1906. No. 78444.

### Rhine.

**New Bridge at Basle.** An illustrated description of the fine stone bridge over the Rhine, recently completed, and the methods of construction. 1700 w. Engg, Lond—April 20, 1906. No. 76451 A.

**The New Bridge over the Rhine at Bâle** (Die Neue Basler Rheinbrücke). E. Gutzwiller. A general description of the new masonry arched bridge, with numerous illustrations. Serial. Part I. 1500 w. 1 plate. Schweiz Bauzeitung—Jan. 6, 1906. No. 74666 B.

**The New Bridge Over the Rhine at Basle.** E. C. Morel. Illustrated description of a beautiful stone bridge of seven spans, and its construction. 2500 w. Archts & Builders Mag—Oct., 1906. No. 79736 C.

### Schuylkill.

**Schuylkill River Bridge.** Illustration and description of a bridge at Philadelphia on the Pennsylvania R. R. The approaches are masonry spans 60 ft. across with piers 70 ft. through, and the abutments of the steel structure are 25 ft. through. The steel span is a Pratt truss deck bridge. 600 w. Ry & Loc Engng—May, 1906. No. 76372 C.

### Short Spans.

**Short-Span Bridges on the Baltimore & Ohio Railroad.** Illustrates and describes types of solid floor bridges, in which the loads are chiefly carried by steel beams and girders and the latter are entirely enclosed in concrete integral with the floor slab. 1500 w. Eng Rec—June 16, 1906. No. 77342.

### Steel Bridges.

**Bridges for Electric Railways.** C. C. Schneider. Considers only steel structures, illustrating a variety of types. 4500 w. St Ry Jour—Sept. 15, 1906. Serial. 1st part. No. 79201 C.

# CIVIL ENGINEERING

## Strengthening

### Strengthening.

The Strengthening and Maintenance of Early Iron Bridges. William Marriott. Describes the measures adopted for the strengthening of two bridges built in the sixties and seventies, in order to adapt them to modern requirements and to protect them from rust. Discussion. Illus. 14500 w. Inst of Civ Engrs. (No. 3554.) No. 74356 N.

The Strengthening of the La Canche Viaduct (Consolidation du Viaduc de la Canche). M. Lefebvre. Describing the manner in which an old masonry viaduct was strengthened by injecting liquid cement into the stone work. 3000 w. 1 Plate. Ann d Ponts et Chaussées—1 Trimestre, 1906. No. 78135 E + F.

### Stresses.

A New Method of Calculating Bridge Stresses by Means of End Shears. W. T. Curtis. Discusses the table of Mr. Gibson in its new form, and commends it as a practical aid in the calculation of stresses in railroad bridges. General discussion. 3000 w. Jour W Soc of Engrs—June, 1906. No. 77506 D.

### Substructure.

Substructure of Potomac River Highway Bridge, Washington, D. C. An illustrated detailed description of the construction work. 2000 w. Eng. Rec—Jan. 27, 1906. No. 74770.

### Suspension.

Chains vs. Cables in the Manhattan Bridge. Wilhelm Hildenbrand. A letter giving arguments and explanation of the calculations on which the writer based his views. Also editorial. 3500 w. Sci Am—Nov. 4, 1905. No. 72967.

The Design of the Post Base of the Manhattan Bridge Towers. Gives an illustrated description of the tower post of this suspension bridge across the East River, New York, designed for very heavy loads. 2000 w. Eng Rec—Nov. 25, 1905. No. 73497.

Recent Progress on the Manhattan Bridge, New York. Illustrated description of the construction methods employed on masonry anchorages of great magnitude. 3500 w. Eng Rec—Aug. 25, 1906. No. 78803.

The Elizabeth Eye-Bar Suspension Bridge at Budapest. Leon Ramakers. A handsomely illustrated description of the new bridge across the Danube at Budapest, with details of the erection and of the manufacture of the eye bars. 2500 w. Engineering Magazine—March, 1906. No. 75165 B.

## BRIDGES

## Thebes

Suspension Bridges and Arches (Ponts Suspendus et Ponts en Arc). E. Lebert. A comparison of the formulas of Godard and of Levy, considering suspension bridges and arches, each as an inversion of the other. 10000 w. Ann d Ponts et Chaussées—1 Trimestre, 1906. No. 78-129 E + F.

Longitudinal Displacement of the Suspended Structure of the Williamsburgh Bridge, at New York, N. Y. A statement and explanation of the displacement, and the remedy. 1200 w. Eng News—Sept. 20, 1906. No. 79288.

Cost of Erecting the Brooklyn Towers and End Spans of the Williamsburgh Bridge, New York City. Francis L. Pruyn. Describes the work and gives a detailed estimate of the cost. Ills. 2500 w. Engng-Con—Oct. 24, 1906. No. 80149.

### Swing Bridge.

The Operation of the New Railway Bridge at Velsen (De Bewegings en Bedieningsinrichtingen der Nieuwe Spoorbrug te Velsen). J. J. W. van Loenen Martinet & F. C. Dufour. A detailed description of the swing bridge over the Noordzee Canal at Velsen, Holland, including the electrical operating mechanism. 4000 w. De Ingenieur—Feb. 17, 1906. No. 75782 D.

New Swing Bridge at Velsen. Illustrated detailed description of a large electrically worked swing bridge over the North Sea Canal in Holland. 1600 w. Engr, Lond—Oct. 19, 1906. No. 80144 A.

The Swing Bridge over the North-Sea Canal at Velsen, Holland (Pont Tourant sur le Canal de la Mer du Nord à Velsen) with a photograph of the completed bridge and details of the electric control of the large swing span. 2000 w. 1 plate. Génie Civil—Sept. 1, 1906. No. 79321 D.

A Heavy Center-Bearing Draw Span. The 270-ft. swing span of the bridge over the Harlem Ship Canal at Kingsbridge, N. Y., is illustrated and described. Its total weight is 3,000,000 pounds. 1000 w. Eng Rec—Sept. 1, 1906. No. 78929.

The Rodah Bridge. An illustrated description of the Rodah swing bridge at Cairo. It is built on seventeen piers, with fifty-five main girders. 600 w. Engr, Lond—April 6, 1906. No. 76084 A.

### Thebes.

The Thebes Railroad Bridge. Charles Alma Byers. An illustrated description of this important bridge crossing the Mississippi River. 900 w. Sci Am Sup—Sept. 1, 1906. No. 78908.

# CIVIL ENGINEERING

## Transporter

## BRIDGES

## Web-Splices

### Transporter.

The Transport Bridge at the Old Port at Marseilles (Pont a Transbordeur sur le Port-Vieux à Marseille). G. Leinekugel le Cocq. Illustrating the erection and operation of a bridge of the transporter type on the Cantilever principle, with a clear span of 165 metres. Serial, Part I. 3000 w. Géine Civil—Feb. 24, 1906. No. 75715 D.

Newport Transporter Bridge. Illustrates and describes this recently completed bridge in England, over the river Usk. 3000 w. Tram & Ry Wld—Sept. 6, 1906. No. 79297 B.

The Transporter Bridge at Newport. An illustrated detailed description of the recently completed bridge across the Usk River in England, with information of related interest. 4000 w. Engr, Lond—Sept. 14, 1906. No. 79453 A.

### Trusses.

The Theory of the Longitudinal Connections of Iron Bridge Trusses (Zur Theorie der Längsverbände Eiserner Fachwerkbrücken). Dr. Alexander Coulmas. A mathematical examination of the action of the various forces on longitudinal connections for different loadings. 7500 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Dec. 2, 1905. No. 73873 D.

### Viaducts.

On the Construction of a Concrete Railway-Viaduct. Arthur Wood-Hill, and Edward Davy Pain. An illustrated detailed account of the construction of a concrete viaduct at Cannington, Eng., consisting of 10 elliptical arches, the total length being 600 ft. Ills. Discussion, and correspondence. 23000 w. (No. 3502.) Inst of Civ Engrs. No. 73150 N.

The Fades Viaduct. E. Ommelange. Illustrated detailed description of this viaduct under construction in France, which will be the highest railroad bridge in the world. 1000 w. R R Gaz—Vol. XXXIX., No. 21. No. 73432.

Rebuilding the Rondout Viaduct. This viaduct on the West Shore R. R. is described and illustrated. The heavy traffic recently sent over the road, made it necessary to strengthen the structure, and the work is described. 4700 w. Eng Rec—April 7, 1906. No. 75981.

The Rondout Viaduct on the West Shore Railroad. Part elevations and plans with detailed description of the double-track structure recently built to replace a lighter superstructure. 2500 w. Eng Rec—July 14, 1906. No. 77939.

Replacing the Ashtabula Viaduct. De-

scribes the old structure and the new one made necessary by the increase in traffic and in weight of locomotives. Ills. 3500 w. Eng Rec—May 19, 1906. No. 76732.

The Sixth Street Viaduct at Kansas City. A steel highway viaduct, costing about \$2,500,000, is briefly described. Ills. 2000 w. Eng Rec—June 2, 1906. No. 77076.

Viaduct Over the River Barrow Near Waterford. Begins an illustrated description of the largest viaduct in Ireland, its design and construction. 4000 w. Engng—May 25, 1906. Serial. 1st part. No. 77137 A.

Cuyahoga Valley Viaduct of the New York, Chicago & St. Louis. Describes a viaduct within the limits of the city of Cleveland, O., 2988 feet long, which spans not only the river, but the valley, being elevated above many industrial tracks, mills, etc. 1000 w. Ry Age—Aug. 3, 1906. No. 78508.

An Eight-Track Reinforced-Concrete Viaduct in Winnipeg, Manitoba. Illustrates and describes a structure on the Canadian Pacific R. R. of interest on account of the special design of the concrete groined arches in it and from the character of the reinforcement. 1200 w. Eng Rec—Sept. 15, 1906. No. 79159.

The Caneadea Viaduct of the Buffalo & Susquehanna Ry. Joseph Mayer. Illustrated detailed description of a high steel viaduct 754 ft. long. 1500 w. Eng News—Sept. 13, 1906. No. 79165.

A Steel Viaduct with Concrete Casing and Floor. Illustrates and describes a six span viaduct for foot passengers being erected across railway tracks at Cedar Rapids, Ia. 600 w. Eng News—Oct. 11, 1906. No. 79719.

Concrete Viaducts on the Key West Extension of the Florida East Coast Ry. George P. Carver. An illustrated article showing the design employed for about 500 reinforced concrete arches from 45 to 60 feet span, and describing the construction work. 2500 w. Eng Rec—Oct. 20, 1906. No. 79882.

### Wabash.

The Wabash River Bridge at Terre Haute, Indiana. Malverd A. Howe. Illustrated description of a new highway bridge having a rather unusual combination of trusses and plate girders. 2000 w. Eng News—March 8, 1906. No. 75438.

### Web-Splices.

The Design of Plate-Girder Web Splices. R. T. Logeman. Remarks pertaining to the design of web-splices in

## CIVIL ENGINEERING

### Wreck

plate-girder bridges, aiming to simplify the design of a splice to resist both shear and bending moment. 3500 w. Eng News—Aug. 30, 1906. No. 78899.

### Wreck.

Draw-Span of the Interstate Bridge at Duluth-Superior, Wrecked by a Steamship; Opening a New Passage in Four Days. An illustrated account of a draw-span wrecked by a colliding vessel, blocking an important harbor, which was opened by the removal of a long fixed span. 1000 w. Eng News—Aug. 30, 1906. No. 78897.

The Interstate Bridge at Duluth Wrecked. An account of the wreck of the drawbridge connecting Duluth and

### CONSTRUCTION

Superior, with illustration. 1200 w. Marine Rev—Aug. 16, 1906. No. 78628. Zambesi.

The Opening of the Victoria Falls Bridge. Harold Shepstone. An illustrated account of the opening of this bridge over the Zambesi gorge in central Africa. 1000 w. Sci Am Sup—Nov. 4, 1905. No. 72969.

The Bridge over the Zambesi River at the Victoria Falls in Rhodesia (Die Bogenbrücke über den Sambesi Fluss bei den Victoriafällen in Rhodesia). G. Barkhausen. A detailed illustrated description of the Zambesi bridge, including structural elements and erection. 4500 w. Zeitsch d Ver Deutscher Ing—Dec. 30, 1905. No. 74604 D.

### Bins

## CONSTRUCTION

### Abattoir.

A Model Fireproof Abattoir. Illustrates and describes the fireproof and sanitary plant of the New York Butchers' Dressed Meat Co., located at Eleventh Ave. and 39th St., and the sanitary conditions adopted. 5000 w. Eng Rec—June 30, 1906. No. 78243 C.

A Model New Abattoir in New York City. Illustrated description of the new plant of the New York Butchers' Dressed Meat Co., located at Eleventh Ave. and 39th St., and the sanitary conditions adopted. 5000 w. Eng Rec—June 30, 1906. No. 77719.

Construction Features of a Model Abattoir. Illustrates and describes the design and construction of the buildings of the New York Butchers' Dressed Meat Co., in New York City. 3800 w. Eng Rec—July 7, 1906. No. 77834.

Power Plant of the New Abattoir in New York City. An illustrated detailed description of a 1600 h.p. boiler plant, with extensive coal storage facilities, an electric generating equipment of an aggregate capacity of 1000 kw. and refrigerating machinery with a total capacity of 250 tons of refrigeration per 24 hrs. 4000 w. Eng Rec—July 21, 1906. No. 78077.

Model Municipal Slaughtering Establishment at Berlin—A Lesson in Sanitary Meat Dressing. William Mayner. Illustrations of the buildings, and description of the methods employed. 1600 w. Sci Am—July 28, 1906. No. 78269.

### Alterations.

Steel Details in the Alterations of the Judge Building. Brief illustrated description of extensive improvements carried

out without disturbing the tenants of the building. The building was raised four additional stories, and a heavy interior wall which carried the ends of the floor beams was removed. 1000 w. Eng Rec—Nov. 11, 1905. No. 73143.

### Beams.

A Floor-Beam Scale in Parallel Co-ordinates. Lucien E. Picolet. Gives a scale for determining the size of steel I beams for floors for any given span and spacing. 1200 w. Eng New—May 31, 1906. No. 77044.

Notes on I Beams (Betrachtungen über I-Profil). A. Hertwig. A review of the plans to standardize rolled structural material in Germany, with diagrams and suggestions for a system. 3500 w. Zeitschr d Ver Deutscher Ing—July 14, 1906. No. 78701 D.

The Computation of Supporting Beams (Beitrag zur Berechnung von Unterzügen). Prof. G. Ramisch. A mathematical study of the distribution of forces in the case of an auxiliary supporting beam beneath several cross beams; with examples for various loadings. 1000 w. Zeitschr d Oesterr Ing u Arch Ver—Aug. 17, 1906. No. 79327 D.

### Bins.

Investigations upon the Bottom and Lateral Pressures in Grain Storage Bins (Versuche zur Ermittlung der Boden und Seitenwanddrücke in Getreidesilos). J. Pleissner. Experimental determinations of the actual vertical and lateral pressures in bins of wood and of reinforced concrete. Two articles. 6000 w. Zeitschr d Ver Deutscher Ing—June 23, 30, 1906. No. 78104 each D.

# CIVIL ENGINEERING

## Buildings

### Buildings.

The King's Sanatorium at Midhurst. Describes the engineering features of this recently built sanatorium, built for the special treatment of sufferers from tubercular disease. 1800 w. Engr, Lond—June 15, 1906. No. 77483 A.

The New Soap Factory Building of Armour & Co. at Chicago. Illustrated description, and report of tests of the reinforced concrete floor system of a factory carrying very heavy loads and subjected to the operation of heavy machinery on the upper floors. 2800 w. Eng Rec—June 2, 1906. No. 77075.

### Building Construction.

Special Column and Girder Details in the Office Building of the New York Central Lines. Describes the arrangements for excessive loads in a building that will have 20 stories when completed. 2000 w. Eng Rec—March 17, 1906. No. 75572.

Dome and Floor Construction in the United States War College. Briefly describes this fine building in Washington, D. C., which is interesting on account of the very small amount of steel required for a structure of its size and containing so many wide spans. Arch ribs of the Guastavino type were used. Ills. 1500 w. Eng Rec—May 5, 1906. No. 76527.

The New Altman Building, New York. Describes the construction of this fine department store at 5th Ave., 34th and 35th Sts., giving details of the steelwork. 1200 w. Eng Rec—Nov. 4, 1905. No. 73063.

Construction of the Title Guarantee and Trust Company Building, New York. The sand foundation is enclosed on all sides by sheet steel piling, and the cantilever beams for the support of the steel cage rest on an extensive grillage and concrete foundation. Ill. 3000 w. Eng Rec—March 17, 1906. No. 75574.

Extension of the Metropolitan Life Insurance Building, New York City. Describing the completion of the third section, with especial reference to the structural steel work and the reinforced concrete floor work and fireproofing. 3000 w. Eng Rec—March 3, 1906. No. 75409.

See Reinforced Concrete.

### Building Design.

The Architecture of Continental Power Plants. Franz Koester. Illustrates and describes examples of European power plant architecture. 2000 w. Elec Wld—Jan., 1906. No. 74310.

### Building Details.

Structural Details in a Maiden Lane

## CONSTRUCTION

## Cement Blocks

Building. Illustrates and describes details of a steel-cage building, eleven stories and basement, in New York. 1600 w. Eng Rec—Nov. 18, 1903. No. 73254.

### Caisson Disease.

Compressed Air Illness; or, Caisson Disease. Thomas Oliver. Abstract of a lecture at the Roy. Inst. of Pub. Health, London. Describes a caisson, and the "compression" and "decompression" of workmen, the admission of pure air, and ventilation. The hygiene and symptoms are discussed, and the prevention and treatment of caisson disease. 4000 w. Min Jour—Jan. 6, 1906. No. 74411 A.

Investigations of the Effect on Man of High Air Pressures. Notes from a paper before the Royal Society, reporting the experiments and conclusions of Dr. Hill and Dr. M. Greenwood, Jr. 2200 w. Eng Rec—June 30, 1906. No. 77722.

### Caissons.

The Use of Caissons in Bridge Building with Remarks Upon Compressed Air Illness. Thomas Oliver. Principally a discussion of caisson disease, its prevention, symptoms, treatment, etc. Discussion. 10000 w. Jour Soc of Arts—May 11, 1906. No. 76711 A.

Extension Ribs and Jacks for Caissons and Trenches. Illustrates and describes a braced caisson system devised for making foundations, or other wells, shafts, etc., in soft material subject to heavy pressure. 600 w. Eng News—Aug. 2, 1906. No. 78393.

Restoring to the Perpendicular a Compressed Air Caisson. Describes an accident, in Belgium, in getting in the foundations of the central pivot pier of a swing span, in sinking of the caisson, and the manner of overcoming the difficulty. Ills. 1000 w. Engr, Lond—Aug. 24, 1906. No. 79014 A.

A Reinforced Concrete Tunnel Caisson. Illustrated description of interesting and unusual work being carried out by the Hudson Companies in connection with the tunnel construction which will connect Manhattan and New Jersey. 4500 w. Eng Rec—Sept. 29, 1906. Serial. 1st part. No. 79553.

### Cement Blocks.

Decorative Forms in Cement Block Construction. Louis H. Gibson. Gives suggestions for the artistic use of this material, recently coming into use. Ills. 2500 w. Munic Engng—Dec., 1905. No. 73755 C.



# CIVIL ENGINEERING

## Cement Pipe

### Cement Pipe.

Method and Cost of Constructing Cement Pipe in Place. Halbert P. Gillette. Briefly describes the invention of Ernest L. Ransome, and the construction work, giving a report of cost. 1200 w. Eng Rec—March 10, 1906. No. 75479.

### Chimneys.

Statcal Computations for Chimneys (Zur Statischen Untersuchung von Schornsteinen). Franz Heckelbacher. A brief examination of the conditions of stability for masonry chimneys of round and square section; with a graphical diagram enabling the proportions to be scaled off directly. 2000 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Nov. 25, 1905. No. 73872 D.

The Photobiography of a Chimney. Edgar Mels. Illustrated description of the second largest chimney in America, built at Newark, N. J. 800 w. Sci Am—Dec. 2, 1905. No. 73554.

A 350-Ft. Brick Chimney for Acid Chemical Gases. Theodore Lindeman. A brick chimney of unusual height recently completed at Newark, N. J., is illustrated and described in detail. 1800 w. Eng News—Feb. 15, 1906. No. 75016.

Recent American Chimney Practice. William Wallace Christie. An illustrated article considering types of chimneys for industrial purposes recently built. 2300 w. Cassier's Mag—Feb., 1906. No. 74-918 B.

Tall Chimney Construction. J. E. Stafford. Detailed particulars and drawings of a tall chimney erected at Clitheroe, Lancashire. 1800 w. Builder—Sept. 8, 1906. No. 79213 A.

### Cofferdams.

Steel Piling Cofferdams for Bridge Piers. Illustrates and describes cofferdams used in building piers for a bridge near Chillicothe, Ohio. 1000 w. Eng Rec—April 21, 1906. No. 76326.

Economy of Steel Sheet Piling for Cofferdams for Bridge Piers. Julian Griggs. A previous account of the construction of a bridge near Chillicothe, Ohio, using steel sheet piles for cofferdams has been given, and the cost is compared with the old coffer dam constructed on the same site in 1885, by the writer. 1300 w. Eng Rec—May 5, 1906. No. 76522.

### Collapse.

Collapse of the Amsden Block, South Framingham, Mass. C. M. Saville. An illustrated account of this building and its failure during construction. 1000 w. Eng News—Aug. 9, 1906. No. 78538.

## CONSTRUCTION

### Columns.

The Theory of Continuous Columns. Ernest F. Jonson. Develops the exact theory of continuous columns in order to deduce from it a simple method of calculating the effect of eccentric loading, both at the floor level and at an intermediate point. 1600 w. Pro Am Soc of Civ Engrs—Jan., 1906. No. 74701 E.

Diagrams for the Strength of Steel and Wooden Columns. Louis Ross. Gives diagrams, illustrating their use by examples. 600 w. Eng News—April 26, 1906. No. 76340.

### Concrete.

Hair Cracks, Cracking and Map Cracks on Concrete Surfaces. Albert Moyer. Gives results of investigations made to determine the cause and the remedy. 1500 w. Eng Rec—Dec. 16, 1905. No. 73920.

Reducing the Voids in Broken Stone for Concrete by Mixing Different Sizes. E. J. McCaustland. Gives results of tests on mixtures of stones of various sizes. 700 w. Eng News—Dec. 7, 1905. No. 73626.

The Decoration of Concrete with Colored Clays. Henry C. Mercer. Read before the Assn. of Am. Port. Cem. Mfrs. Suggestions for the artistic treatment of concrete, with editorial. 2500 w. Eng News—Dec. 28, 1905. No. 74032.

Concrete Construction for the B. T. Babbitt Works. Illustrates and describes the construction of extensive works for the manufacture of soap, about nine miles from Jersey City. 1400 w. Eng Rec—Dec. 30, 1905. No. 74138.

Legal Requirements in Regard to Concrete Building Construction. Rudolph P. Miller. Abstract of a paper read at the meeting of the Nat. Assn. of Cement Users. Discusses the quality of the cement and associated material, legal requirements for workmanship, etc. 4000 w. Eng News—Jan. 25, 1906. No. 74567.

Retempered Mortar in Concrete Work. Ernest McCullough. Information concerning excellent results obtained by an old English mason, especially in patching and repairing old concrete. 1000 w. Eng News—Jan. 11, 1906. No. 74331.

Concrete Buildings in the United States. An illustrated detailed description of the applications of concrete to building construction, with the use of monolithic construction, and of concrete building blocks. 2000 w. Engr, Lond—Feb. 9, 1906. Serial 1st part. No. 75067 A.

Concrete Mixers. J. S. Owens. Read before the Civ. & Mech. Engrs. Soc. Illus-

## Concrete

# CIVIL ENGINEERING

## Concrete Blocks

trates and describes various machines that have been devised, discussing the methods in use. 5000 w. Engng—Feb. 9, 1906. No. 75077 A.

Practical Notes on Concrete Building Construction. C. A. P. Turner. Abstract of a paper read before the Nat. Assn. of Cement Users. Remarks on materials and the reliability of the construction as compared with steel or timber, giving information from the writer's experience. 2700 w. Eng News—Feb. 1, 1906. No. 74808.

A large concrete Gas Holder Tank. A sunken concrete tank for a 5,000,000 cu. ft. gas holder recently built at the foot of 136th St., New York City, is illustrated and described. 2500 w. Eng Rec—March 3, 1906. No. 75394.

The Possibilities of Concrete Construction from the Standpoint of Utility and Art. William L. Price. Read before the Assn. of Am. Portland Cement Mfrs. Discusses the dangers and possibilities of this material. 1600 w. Sci Am Sup—April 28, 1906. No. 76382.

An All-Concrete Manufacturing Building. An illustrated description of the large manufacturing building of Spear & Co., at Woodhaven Junction, L. I., N. Y. 2000 w. Archts & Build's Mag—Aug., 1906. No. 78513 C.

Concrete Construction at the Rambler Automobile Works. John Erwood. Illustrated description of concrete construction in saw-toothed roofed, extensible, light machine-shop buildings at Kenosha, Wisconsin. 2000 w. Am Mach—Vol. 29. No. 33. No. 78577.

Concrete in Factory Construction. E. A. Trego. Illustrates and describes examples of modern factories, with a general review of the principles of construction. 5000 w. Cement Age—Oct., 1906. No. 79859.

Speed in the Erection of Concrete Buildings. J. G. Ellendt. A report of recent building for the Yale & Towne Manufacturing Co., of Stamford, Conn. Ills. 800 w. Cement Age—Oct., 1906. No. 79862.

## Concrete Blocks.

The Waterproofing of Concrete Blocks and Walls. H. H. Rice. Discusses the causes of permeability and the remedies. Ills. 1500 w. Cement Age—Dec., 1905. No. 73711.

Waterproofing. J. L. Mothershead, Jr. Read at Con. of Nat. Assn. of Cement Users. Considers the waterproofing of concrete blocks. 1200 w. Munic Engng—Feb., 1906. No. 75217 C.

Causes of Failures in the Concrete Block Business. O. U. Miracle. Read at

## CONSTRUCTION

## Dams

Con. of Nat. Assn. of Cement Users. Discusses the most serious dangers that seem to threaten this industry. 2500 w. Munic Engng—Feb., 1906. No. 75219 C.

The Selection of Portland Cement for Concrete Blocks. Richard K. Meade. Read before the Nat. Assn. of Cement Users. Points out the properties most requisite in Portland cement to be used for the manufacture of concrete blocks. 4500 w. Eng Rec—Feb. 10, 1906. No. 74975.

## Contracts.

Different Plans of Letting Contracts. Frank B. Gilbreth. From a paper presented before the Am. Pub. Works Assn. Describes briefly what is known as the "Lump Sum" contract, and the "Percentage" contract, and gives details of the "Cost-Plus-a-Fixed-Sum" contract. 2200 w. Eng News—Oct. 18, 1906. No. 79835.

## Culverts.

Concrete Tile Culverts in Ontario. Information from the report of A. W. Campbell relating to the extensive use of concrete tile for small highway culverts, considering points in their construction. 1800 w. Eng Rec—Oct. 13, 1906. No. 79782.

## Custom House.

Some Structural Features of the New Custom House at New York. Outline description of the building, illustrating details of interest, and describing special features. 2500 w. Eng Rec—May 19, 1906. No. 76736.

## Dams.

Notes on Stresses in Masonry Dams. Max am Ende. A study of the distribution of compression and shearing stresses, deriving formulas for tracing the trajectories of the maximum tensile, compression, and shearing stresses in a masonry dam. 2800 w. Engng—Dec. 8, 1905. No. 73904 A.

The Changes at the New Croton Dam. Charles S. Gowen. An expression of the writer's views in regard to the necessity of removing the embankment section, at the south and replacing with an extension of the masonry section. Does not think the rock foundation of the core-wall was unsafe. Ills. 3500 w. Pro Am Soc of Civ Engrs—Dec., 1905. No. 74093 E.

The New Croton Dam. Edward Wegmann. An illustrated review of this important engineering work. 5000 w. Eng News—Oct. 14, 1906. No. 79618.

Completion of the New Croton Dam. An illustrated article giving information in regard to the methods of construction, cost, and design of this important work.

# CIVIL ENGINEERING

## Earthquake

## CONSTRUCTION

## Earthquake

2500 w. Eng Rec—Jan. 6, 1906. No. 74275.

The Roosevelt Irrigation Dam in Arizona. Information concerning this extensive engineering work, with illustrations showing the substantial character of the concrete work. 1000 w. Sci Am—Dec. 16, 1905. No. 73724.

Internal Stresses in Masonry Dams. S. D. Bleich. Walls containing water only are considered as illustrative of all others. A mathematical study of the distribution of shear along horizontal and vertical planes. 1200 w. Sch of Mines Qr—Nov., 1905. No. 74547 D.

The Pedlar River Concrete Block Dam, Lynchburg Waterworks. Illustrated detailed description of the construction of this dam in Virginia. 2800 w. Eng Rec—May 12, 1906. No. 76646.

Recent Practice in Hydraulic-Fill Dam Construction. James D. Schuyler. An account of the writer's experience in this class of construction with facts from the experience of others. This process cheapens the cost of handling and compacting earth, making it feasible to increase the bulk of any dam without unreasonable cost. Ills. 18600 w. Pro Am Soc of Civ Engrs—Oct., 1906. No. 80100 E.

The Wachusett Dam. Illustrates and describes this dam of the Metropolitan Water Works, recently completed at Clinton, Mass. 900 w. Eng Rec—Oct. 6, 1906. No. 79669.

## Earthquake.

Burnt Clay Construction at San Francisco. Charles H. Alden, Jr. An illustrated account of the condition of materials subjected to the earthquake and fire. 3000 w. Br Build—May, 1906. No. 77180 D.

Earthquakes and Earthquake-Proof Buildings. William F. Scott. Considers the construction of such buildings should be the same as an ocean liner, but as that is impossible, suggests a compromise. 1000 w. Can Archt & Build—May, 1906. No. 77032 C.

Observations of Distant Earthquakes. F. Omori. An explanation of observations made in Tokio, of the San Francisco earthquake, and the determination of the locality and time of the shock. Also editorial. 4000 w. Min & Sci Pr—June 16, 1906. No. 77459.

Our Greatest Earthquakes. Myron Leslie Fuller. Principally an illustrated description of the earthquakes of 1811 and 1812 in the New Madrid region, on the Mississippi River. 4000 w. Pop Sci M—July, 1906. No. 77497 C.

Report of the State Earthquake Commission. Chief part of the report of the Commission appointed to investigate the earthquake which led to the great conflagration at San Francisco. Ills. 3300 w. Min & Sci Pr—June 16, 1906. No. 77460.

Steel Structures in the San Francisco Disaster. George Simpson. A report of the effects of fire, dynamite and earthquake upon the skyscraper. Ills. 6000 w. Ir Age—June 7, 1906. No. 77151.

The Destructive Extent of the San Francisco Earthquake of 1906. Charles Derleth, Jr. Remarks on the evidences of instability of the earth's crust, especially in the San Francisco region, faults, displacements, effects of geological structure, etc., with illustrated description of the destruction wrought at various points by the recent earthquake. 5500 w. Eng News—June 28, 1906. No. 77529.

The Earthquake Explained. A. S. Cooper. Map and explanation of the faults and step-faults of this region. 700 w. Min & Sci Pr—June 16, 1906. No. 77461.

The Effects of Earthquake and Fire on Modern Steel Buildings. Clarence Heller. Personal observations of the San Francisco disaster, and the lessons in building construction there brought out. 3500 w. Engineering Magazine—July, 1906. No. 77684 B.

The Geological Prelude to the San Francisco Earthquake. George H. Ashley. A résumé of the recent geologic history of the San Francisco peninsula and the observed evidence upon which the statement of that history is based. 2000 w. Pop Sci M—July, 1906. No. 77496 C.

The Great Fire in San Francisco. W. G. Mitchell. A report of the effect of the fire upon the buildings, and the material that best withstood the severe trial. 1800 w. Am Archt—June 2, 1906. No. 77083.

The Probable Cause of the San Francisco Earthquake. Frederick L. Ramsome. An explanation of the geology of the region and the rock movements causing the earthquake. Map. 1700 w. Min & Sci Pr—June 16, 1906. No. 77458.

The Structural, Municipal and Sanitary Aspects of the Central Californian Catastrophe. Charles Gilman Hyde. An illustrated article presenting a statement of conditions produced by earthquake and fire, and conclusions drawn from them. 3700 w. Eng Rec—June 2, 1906. Serial. 1st part. No. 77069.

# CIVIL ENGINEERING

## Earth Slides

### Earth Slides.

The Clay Slide at the Boone Viaduct, Boone, Iowa. A. W. Merrick. An account of this slip or slide and the methods of drainage for remedying the trouble. Also a paper by E. E. R. Tratman on "Foreign Railway Construction on Sliding Ground." Ills. 7500 w. Jour W Soc of Engrs—June, 1906. No. 77507 D.

### Economy.

Economy of Material in Framed Structures. Shows how material is wasted, especially when the structure is designed to support a very heavy load. The metal selected is cast iron. 1000 w. Am Mach—Vol. 29. No. 35. No. 78886.

### Erection.

American Methods of Erecting Buildings. R. A. Denell. Considers constructive methods, especially in regard to the increase in rapidity of construction and economy. Ills. Discussion. 12000 w. Jour Roy Inst of Brit Archts—Nov. 25, 1905. No. 74037 D.

Methods of Raising an Elevated Railroad Structure. Brief illustrated description of an interesting and rather unusual piece of work in progress in Chicago. 1500 w. Eng Rec—March 3, 1906. No. 75395.

### Excavation.

A Machine for Excavating Narrow Ditches (Maschine zum Ausheben Schmalen Graben). Eugen Eichel. Describing an American apparatus using a revolving wheel carrying excavating buckets for digging ditches for drain pipes. 1000 w. Zeitscher d Ver Deutscher Ing—Jan. 13, 1906. No. 74612 D.

Methods and Cost of French Excavation with a French Digging Machine. Halbert P. Gillette. Gives cost data relating to excavating trenches with a machine, showing that the work can be done at a cost that compares favorably with dredging and hydraulic. 1800 w. Eng Rec—Dec. 30, 1905. No. 74136.

Difficult Excavation on the Hennepin Canal. An illustrated description of difficult work being executed by the U. S. Government on the Illinois and Mississippi ship canal. A Lidgerwood duplex traveling cableway of special design is used. 1200 w. Eng Rec—Feb. 10, 1906. No. 74973.

A Submarine Rock Excavator. Charles Graham Hepburn. Describes an apparatus, designed and built in New South Wales, for the purpose of wharf-building and operations on submarine rock. Ills. 1000 w. (No. 3469.) Inst of Civ Engrs. No. 73165 N.

## CONSTRUCTION

## Fireproofing

Excavation for Dry Dock No. 4, Brooklyn Navy Yard. Describes this dock, now under construction, and the very difficult conditions to be met; also the preparations made to avoid trouble and delays. Ills. 2800 w. Eng Rec—March 3, 1906. No. 75398.

The Novel Methods of Excavating Building Sites in Chicago. Describes the methods adopted in order to enable contractors to employ the subway freight tunnels for the removal of material. Ills. 3000 w. Eng Rec—March 10, 1906. No. 75476.

The Cost of Rock Excavation Under Water on the Detroit River. Map and information of the work now in progress for deepening the channel of the Detroit River. 1000 w. Eng News—Aug. 16, 1906. No. 78582.

The Cost of Steam Shovel Work in Railway Betterment. S. T. Neely. Considers the steam shovel work as it should be carried out, the limitations of steam shovels, rainy day expenses, material moved, spreading, overhaul, etc., giving figures of costs from actual work. 2300 w. Eng News—Aug. 9, 1906. No. 78534.

See Civil Engineering, Waterways.

### Fireproof.

A \$3,000 Fireproof House. F. W. Fitzpatrick. Illustrates and describes pleasing dwellings of hollow tile fireproof construction. 2200 w. Ins Engng—Dec., 1905. No. 74068 C.

The Majestic Building. Illustrated description of a fireproof combination theater and office building in Chicago. 1800 w. Ins Engng—Dec., 1905. No. 74069 C.

Concrete and Hollow Tile. E. A. Trego. Illustrates and describes an example of the combined use of reinforced concrete and tile in fireproof construction. 1600 w. Cement Age—Feb., 1906. No. 75211.

Paper on Fireproof Construction. Owen Brainard. Read before the Ontario Assn. of Archts. Discusses the protection of steel skeleton buildings from both exterior and interior fires. 5800 w. Can Archt—Jan., 1906. No. 74927 C.

Developing Fireproof Architecture. George E. Walsh. Shows the effect of recent changes of building construction upon fireproof clay products, and the importance of furnishing good materials. 2500 w. Brick—July, 1906. No. 77901.

### Fireproofing.

Fireproofing and Insurance. Edward T. Cairns. A discussion of the position concrete is to occupy in the art of fire-

# CIVIL ENGINEERING

## Fire Protection

proof construction. 4200 w. *Munic Engng*—May, 1906. No. 76910 C.

Fireproof Domes and Stairways. George E. Walsh. An illustrated article showing examples of the use of terra cotta hollow tiles in the construction of ceilings, domes and stairways. 2700 w. *Ins Engng*—April, 1906. No. 76485 C.

Notes on the Fireproofing in San Francisco Buildings After the Fire. B. B. Holland. An illustrated report of a number of buildings of fireproof construction, examined by the writer. 2000 w. *Eng Rec*—May 26, 1906. No. 76957.

Fire-Resisting Construction and the Ultimate Life of Mercantile Buildings: A Plea for Better Constructive Methods. J. K. Freitag. Comments on the justness of English criticism of American practice, as shown in a recent discussion of a paper by Reuben A. Denell. 3800 w. *Eng News*—April 26, 1906. No. 76342.

The Farwell, Ozmun, & Kirke Co., Warehouse at St. Paul. W. H. Dillon. Description of fireproof construction in reinforced concrete. 1800 w. *Eng Rec*—April 21, 1906. No. 76330.

See Reinforced Concrete.

## Fire Protection.

Fire Protection Precautions at the Stuyvesant Docks. H. W. Parkhurst. An illustrated article explaining the changes that have been made and their object, in these terminal facilities of the Illinois Central at New Orleans. 3500 w. *R R Gaz*—Vol. XXXIX, No. 25. No. 74012.

The Safeguarding of Life in Theaters, A Study from the Standpoint of an Engineer. John R. Freeman. Presidential address before the A. S. M. E. A statement of present conditions, the problem presented and the solution, with a discussion of the subject generally. Also editorial. 15500 w. *Ills. Eng News*—Dec. 14, 1905. No. 73732.

The Vienna Model Theatre for Fire Tests (Das Wiener Modelltheater für Brandversuche). H. Harder. An account of the tests made upon a model building to determine the best methods of protecting theatres against fire. 3000 w. *Gesundheits Ingenieur*—Dec. 20, 1905. No. 74669 B.

## Floors.

Fire and Water Tests of Stone-Concrete and Cinder-Concrete Floors Reinforced with Corrugated Bars. Gives drawings of two forms of reinforced concrete floors, with report of tests made and the effects. 700 w. *Eng News*—Feb. 1, 1906. No. 74804.

## CONSTRUCTION

## Foundations

I. Fire Test of a Concrete Floor with Bays of Different Aggregates. II. The Resistance of Cement and Concrete Construction to Fire. Two papers discussed together editorially. The first is an abstract of report on experimental fire test made by the British Fire Prevention Committee. The second an abstract of a report presented at meeting of the Nat. Assn. of Cement Users. 6800 w. *Eng News*—Feb. 1, 1906. No. 74805.

The Economical Design of Reinforced Concrete Floor Systems for Fire-Resisting Structures. Discussion of a paper by John S. Sewell, on this subject. *Ills.* 20500 w. *Pro Am Soc of Civ Engrs*—March, 1906. No. 75835 E.

The Economical Design of Reinforced Concrete Floor Systems for Fire-Resisting Structures. Discussion of paper on this subject by John S. Sewell. 12000 w. *Pro Am Soc of Civ Engrs*—May, 1906. No. 76934 E.

Reconstruction of the Floors in the Equitable Building, Baltimore, Md. Corydon T. Purdy. Illustrates and describes the terra cotta arch construction adopted for rebuilding these floors after the fire. 900 w. *Br Build*—Sept., 1906. No. 79715 D.

Vibrations of Concrete Floors. E. P. Goodrich. Remarks on the advantages of reinforced concrete in places subject to earthquakes, giving illustrations from San Francisco. 1000 w. *Cement Age*—Oct., 1906. No. 79861.

## Foundations.

Corrugated Concrete Foundation Piles. Describes briefly the method adopted for foundations of the Lattemann Building, Brooklyn, intended for use as a shoe factory. 1000 w. *Eng Rec*—Nov. 11, 1905. No. 73142.

Sinking a Foundation Caisson with Post-Hole Augers. Illustrated description of unusual construction at the General Electric Co.'s works at Schenectady, to build engine foundations in quicksand. 600 w. *Eng Rec*—Nov. 18, 1905. No. 73249.

Sinking Machinery Foundations in Quicksand Without Excavation. Describes an ingenious and novel method of constructing foundations for a 60-ft. boring mill at the General Electric Co.'s plant, at Schenectady. 1000 w. *Eng Rec*—Nov. 4, 1905. No. 73065.

Building and Machinery Foundations in Quicksand. Illustrates and describes methods used in building foundations for the Knickerbocker Building at 114 and 118 West 39th St., New York City.

## CIVIL ENGINEERING

### Foundations

2700 w. Eng Rec—March 3, 1906. No. 75388.

Unusual Foundations at the Hoboken Terminal of the Lackawanna R. R. Outlines conditions and gives an illustrated detailed description of the foundation work. 2000 w. Eng Rec—Nov. 11, 1905. No. 73141.

Foundations for Chicago Buildings. John M. Ewen. A short history of the foundations of Chicago buildings since the great fire, calling attention to the improvements made from time to time. Discussion. Ills. 4500 w. Jour W Soc of Engrs—Dec., 1905. No. 74553 D.

Modern Foundation Construction with Concrete Piles (Ueber Neuere Fundierungsmethoden mit Betonpfählen). K. E. Hilgard. An illustrated description of the various systems of making and driving piles of reinforced concrete, showing the superiority of such foundations to wooden piles. Serial. Part I. 2000 w. Schweiz Bauzeitung—Jan. 20, 1906. No. 75125 B.

Substructure for the United States Express Company's Building. A 23-story building on Greenwich St., New York, which involved considerable difficulty in building the substructure, the foundations being carried through water and quicksand to rock at a depth of 41 ft., is illustrated and described. 4300 w. Eng Rec—March 3, 1906. No. 75411.

The Steel Foundations of the Title Guarantee & Trust Co. Building, New York. Describes details of foundation work for a steel-cage office building in New York City, especially the methods adopted for excavating below the water level. 1400 w. Eng Rec—April 28, 1906. No. 76415.

A New System of Foundations (Ueber eine Neue Gründungsart). Fritz Hromaka. A description of the Dulac system, in which holes made by a falling pointed ram are filled with concrete. 3000 w. Oesterr Wochenschr f d Oeffent Baudienst—May 26, 1906. No. 77621 D.

Mechanical Compression of the Ground in the Construction of Foundations. Emile Guarini. Illustrates and describes a method discussed in a lecture by M. Ducloux, before the Société Belge d'Ingenieurs et Industriels. It consists in compressing the ground by treating it with concrete so as to compress it laterally and depthwise. 2300 w. Sci Am—June 9, 1906. No. 77253.

A Concrete Foundation. J. Mayne Baltimore. Illustrates and describes how one of the most dangerous rocks of the California coast was converted into a

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foundation for a lighthouse by the use of concrete. 600 w. Cement Age—July, 1906. No. 77861.

Footings in Foundations. Wilfrid Joseph Dilley. An investigation made to determine the slope for varying conditions. 1500 w. Inst of Civ Engrs—No. 3572. No. 78021 N.

The Foundation of the Myers Building, Albany. Illustrated description of methods used in reconstructing this department store, and the bracing and underpinning of adjacent buildings. 3300 w. Eng Rec—June 30, 1906. No. 77726.

Some Foundations for Buildings in Cleveland. Gen. J. A. Smith. Reviews successful past-foundation work in Cleveland and protests against the change to pile foundations for heavy buildings. General discussion. 14000 w. Jour Assn of Engng Soc—April, 1906. No. 78238 C.

A Buffalo Foundation Problem. Illustrated description of the methods adopted by the New York State Steel Co., in building the foundations for the 48x60 in. engine which is to drive the 36 in. blooming mill. The condition of the land is explained. Steel sheet piling was used. 1200 w. Ir Age—Aug. 9, 1906. No. 78479.

Comparative Designs of Steel and Reinforced Concrete for Cantilever Foundation Girders. Illustrates and describes the preliminary design for steel cantilever girders and grillage, and the accepted plan of reinforced-concrete footings and girders. 700 w. Eng Rec—Sept. 1, 1906. No. 78926.

### Framing.

A Study of Statically Indeterminate Frameworks (Studie über das Statisch Unbestimmte Raumbachwerk). Josef v. Gerstenbrandt. Discussing especially the framing of polygonal cupolas and similar structures, with analytical and graphical solutions, for various loadings. 6000 w. Oesterr Wochenschr f d Oeffent Baudienst—April 28, 1906. No. 76836 D.

### Frameworks.

The Graphical Determination of the Lines of Pressure in Framed Structures (Graphische Ermittlung der Einflusslinien für die Spannungen im Fachwerk). S. K. Drach. Discussing especially the case of a three-hinged framed arch. 2500 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 29, 1905. No. 74620 D.

### Grain Elevator.

New Grain Elevator for the Santa Fe System at Chicago. Illustrated description of a new elevator under construction, which possesses unique features of

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## Grouting

interest. 1100 w. Ry Age—March 23, 1906. No. 75811.

## Grouting.

Grouting a Leaky Tunnel on the Paris, Lyons and Mediterranean Ry. Describes repairs to the Limonest tunnel. The method adopted was to pump cement grout through holes in the arch. Ills. 1200 w. Eng News—Oct. 11, 1906. No. 79720.

## Highways.

Highway Construction. James Owen. Read before the Am. Soc. of Munic. Imp. Discusses the fundamental factors in road construction, and the application of tar to overcome the dust trouble. 4000 w. Eng Rec—Oct. 27, 1906. No. 80109.

Oil Tar as a Dust Layer and Weed Destroyer. George H. Waring. An account of the use, with success, of this product for road betterment. General discussion. 4500 w. Progressive Age—Oct. 15, 1906. No. 79760.

## Hotel.

The Hotel Blenheim. J. Fletcher Street. Handsomely illustrated description of a new type of construction used for a fine hotel at Atlantic City, N. J. It is an armored concrete and tile construction, and was built in six months, at a cost of \$126,000. 2200 w. Brickbuilder—April, 1906. No. 76506 D.

## House Wrecking.

The Business of House-Wrecking. George Ethelbert Walsh. Describes the systematic work of the large wrecking companies. 2500 w. Archts & Builds' Mag—Sept., 1906. No. 79188 C.

## Lighthouse.

The Construction of a Tower in Cement Concrete (La Construction d'une Tour en Béton de Ciment). M. Alexandre. Detailed description of the erection of a concrete lighthouse tower 64 metres high, at the Pointe de la Coubre, at the mouth of the Gironde, France. 7500 w. 2 plates. Ann d Ponts et Chaussées—I Trimestre, 1906. No. 78128 E + F.

## Loading.

In Relation to Loading Long Structural Material. T. S. Kirk. Reviews the changes which have made the loading question much more difficult in recent years, and discusses briefly some of the questions. General discussion follows. 15500 w. Pro Ry Club of Pittsburgh—Jan. 26, 1906. No. 76386 C.

## Moving Buildings.

Moving a Block of City Residences. Describes the removal of two rows of city residences in Brooklyn, N. Y., of brick and stone construction of different styles,

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## Piles

built at different periods. Ills. 1200 w. Eng Rec—Dec. 16, 1905. No. 73922.

## Naval Station.

Structural Features of the New Buildings at the New Orleans Naval Station. L. F. Bellinger. Illustrations with brief description. 700 w. Eng Rec—Oct. 28, 1905. No. 72909.

## Office Buildings.

Reinforced Concrete Bank and Office Building, Los Angeles, Cal. Max J. Welch. Illustrates this recently completed building, discussing the engineering details of the construction. 1000 w. Eng News—July 5, 1906. No. 77821.

The Design, Installation and Maintenance of the Modern Office Building. Charles Gobrecht Darrach. A review of the design, construction and of the mechanical installations required to meet the necessities of these business centers. Ills. 6000 w. Jour Fr Inst—July, 1906. No. 78010 D.

The United States Express Co.'s Building, New York City. Illustrated detailed description of a 22-story, basement and cellar building on Rector & Greenwich Sts., New York City. Especial care was given to the provisions for wind pressure. 3000 w. Eng Rec—July 28, 1906. No. 78277.

An Eighteen-Story Steel-Cage Building. Illustrated description of a building under construction at the corner of Wall St. and Broadway, New York City. 1600 w. Eng Rec—Sept. 22, 1906. No. 79432.

The Trust Company of America Building. Illustration of a new building of 25 stories above street level, being erected in Wall St., New York City, and a description of interesting construction methods. 4000 w. Eng Rec—Oct. 20, 1906. Serial. 1st part. No. 79887.

## Piers.

Novel Steel Pier Construction at Lome, Africa. Brief illustrated description. 400 w. Eng News—May 24, 1906. No. 76782.

A Novel Method of Cylinder Pier Reinforcement. Illustrated description of a novel method of strengthening old cylinder piers, used on a bridge at Clarendon, Ark. 700 w. R R Gaz—Aug. 31, 1906. No. 78965.

## Piles.

Improved System of Concrete Piling. The report of the Committee on Science and the Arts on the invention of Frank Shuman. 700 w. Ills. Jour Fr Inst—Dec., 1905. No. 73935 D.

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## Rapid Construction

**Reinforced Concrete Pile Foundations** for the Lattemann Building, Brooklyn, N. Y. Illustrates and describes the largest foundation work with reinforced concrete piles yet carried out in the United States. 1200 w. Eng News—Dec. 7, 1905. No. 73624.

**The Simplex System of Concrete Piling.** Constantine Shuman. An illustrated detailed description of this method of constructing foundations, the apparatus used and the process of producing a concrete pile. Also reviews the development, the uses, &c., and gives a general discussion. 7000 w. Pro Engrs' Club of Phila—Oct., 1905. No. 73937 D.

**Concrete Piles.** David Lay. Illustrated description of the methods of manufacture and use of two leading types of concrete piles which are replacing wooden piles. 1800 w. Cement Age—Feb., 1906. No. 75212.

**Manufacture and Use of Concrete Piles.** Henry Longcope. Read at Con. of Nat. Assn. of Cement Users. Reviews the methods of pile construction tried at various times, especially the use of concrete. 2500 w. Munic Engng—Feb., 1906. No. 75218 C.

**Manufacture and Use of Concrete Piles.** Henry Longcope. Read before the Cement Users Assn. Reviews briefly the attempts with piles other than wood, and the development of this satisfactory system of construction now in use. 2300 w. Sci Am Sup—May 12, 1906. No. 76632.

**Concrete as Piling.** Frank B. Gilbreth. Read at meeting of Am. Portland Cement Mfrs. Illustrated description of the making and driving of corrugated concrete piles. 1600 w. Cement Age—July, 1906. No. 77860.

**Cost of Making and Placing Reinforced Concrete Piles at Atlantic City.** N. J. Gives a summary of the cost of the reinforced concrete trestle of two-pile bents used in widening the promenade sections of the pier. Ills. 400 w. Eng News—Sept. 6, 1906. No. 79095.

**The Use of Concrete Piles.** Translated from *Le Génie Civil*. Illustrated descriptions of various types of concrete piles and their construction. 1800 w. R R Gaz—Sept. 21, 1906. No. 79402.

## Rapid Construction.

**Rapid Construction of an Industrial Plant.** Illustrated description of the methods followed at the St. Croix Paper Company's Works, Spragues Falls, Me. 2000 w. Eng Rec—Jan. 6, 1906. No. 74273.

## CONSTRUCTION

### Reconstruction.

**Reconstruction of the Mercantile Building, New York City.** Illustrates and describes the methods used in adding six more stories, and building a steel-cage addition on the East Side. 3300 w. Eng Rec—Oct. 28, 1905. No. 72910.

### Reinforced Concrete.

**A Reinforced Concrete School Building.** Illustrates and describes a very beautiful private school building in New York. 1400 w. Archts' & Bldrs' Mag—Nov., 1905. No. 73261 C.

**Reinforced Concrete Building, for the Park Square Motor Mart, Boston.** G. H. Brager. Illustrated description of a building under construction for the storage of motor vehicles. 1800 w. Eng Rec—Nov. 18, 1905. No. 73251.

**Reinforced Concrete and Tile Construction in an Atlantic City Hotel.** Illustrated detailed description of the construction of the annex of the Hotel Marlborough, built entirely of hollow tiles, combined with reinforced concrete and terra cotta, without any structural steel, brick or timber work. 3000 w. Eng Rec—Dec. 23, 1905. Serial. 1st part. No. 74018.

**The Computations for T-shaped Floor Beams of Reinforced Concrete** (Beitrag zur Berechnung der Plattenbalken von T-förmigen Querschnitte aus Eisenbeton). G. Ramisch. Deriving formulas for beams of T section, reinforced with round rods near the lower edge. 2000 w. Zeitschr d Oesterr Ing u Arch Ver—Nov. 17, 1905. No. 73821 D.

**The Construction of a Reinforced Concrete Power House.** Brief illustrated description of a building just completed for the Baltimore Electric Power Company. 1000 w. Sci Am Sup—Dec. 9, 1905. No. 73636.

**The Economical Design of Reinforced Concrete Floor Systems for Fire-Resisting Structures.** John S. Sewell. Aims to present simple and accurate formulas, with methods of applying them, to designs of minimum cost, and to show the value of certain little used features of design, from a fire-resisting and economical point of view. 10400 w. Pro Am Soc of Civ Engrs—Dec., 1905. No. 74095 E.

**A Reinforced Concrete Shoe Factory in Brooklyn.** Illustrated description of an interesting example of factory design. 2500 w. Eng Rec—Jan. 20, 1906. No. 74503.

**Fireproof Construction and Prevention of Casualties by Fire.** H. F. J. Porter. In discussion of paper by E. N. Hunting before the A. S. M. E. Urges the development of a regular fire corps in factories



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and shops, fire drills, &c. 1700 w. Am Mach—Vol. 29, No. 1. No. 74209.

Notes on Reinforced Concrete. J. R. Worcester. Read before the Boston Soc. of Archts. Discusses the quality of the cement used, the advantage of reinforcement, the applications made of this material, the difficulties and disadvantages, &c. 4500 w. Am Archt—Jan. 6, 1906. No. 74230.

Reinforced Concrete Fence Posts. Philip L. Wormsley, Jr. Extract from Farmers' Bulletin, Dept. of Agriculture. Gives information concerning the construction recommended, and report of tests. Ills. 2500 w. Eng News—Jan. 18, 1906. No. 74458.

Reinforced Concrete. Harrison Albright. Points out some of the stumbling blocks which beginners are apt to meet in their first attempts in reinforced concrete construction, and the essentials to success. 1600 w. Cement—Jan., 1906. No. 74193 C.

Reinforced Concrete in Building Construction. Discussion by Messrs. Emile G. Perrot, Walter Loring Webb, C. A. Hexamer, James S. Merritt, and E. P. Cowell. Ills. 8000 w. Jour Fr Inst—Jan., 1906. No. 74549 D.

Reinforced Concrete Water Tower at Bordentown, N. J. Briefly outlines recent changes made in the water supply, and describes the tower. Ills. 2000 w. Eng Rec—Jan. 13, 1906. No. 74386.

The Reinforced Concrete Factories for the Bush Terminal. Illustrated detailed description of factories which are in process of construction in South Brooklyn. 2500 w. Eng Rec—Jan. 13, 1905. No. 74385.

U. S. Naval Academy Chapel, Annapolis, Md. Illustrations, with brief description of this interesting example of the use of concrete in building operations. 1000 w. Cement—Jan., 1906. No. 74191 C.

Notes on Reinforced Concrete for Columns. James E. Howard. Considers the method of reinforcing by hooping, and the method of reinforcing by longitudinal bars, and their advantages. 2000 w. Eng Rec—Feb. 10, 1906. No. 74978.

Notes on the Friction of Iron Reinforcements in Beams (Beitrag zur Bestimmung des Gleitwiderstandes bei Balken aus Eisenbeton). G. Ramisch. A mathematical examination of the relation of the frictional resistance of reinforcing rods to the shearing resistance of the concrete, in beams reinforced with plain round or flat rods. 2000 w. Zeitschr d Oesterr Ing u Arch Ver—Jan. 26, 1906. No. 75123 D.

Reinforced Concrete on the Pacific Coast. H. A. Crafts. Brief illustrated description of the construction of a concrete

and steel paper-mill building at Oregon City, Oregon. 1000 w. Sci Am—Feb. 24, 1906. No. 75084.

Steel for Reinforcement. A. L. Johnson. Read at Con. of Nat. Assn. of Cement Users. Discusses the resistance of the bars, some things tending to impair the bond, and fundamental principles. 2300 w. Munic Engng—Feb., 1906. No. 75214 C.

Erection of a Reinforced Concrete Factory for the Bush Terminal Company. Illustrates and describes details in construction of this 75x300 ft. seven-story building in South Brooklyn, N. Y. The floors are calculated for loads of 800 lbs. per square ft. 2500 w. Eng Rec—March 3, 1906. No. 75400.

Formulas for Reinforced Concrete Beams. Henry Goldmark. Considers the advantages and objections of reinforced concrete, and the methods for calculating the stresses in reinforced concrete beams. 6800 w. Can Soc of Civ Engrs—Feb. 22, 1906. No. 75618 D.

Reinforced Concrete and Tile Construction, Marlborough Hotel Annex, Atlantic City, N. J. Illustrated detailed description of a building in which the framework, including columns, girders and roofs, is reinforced concrete, while the walls and floor filling are burnt clay hollow tile. 3500 w. Eng News—March 8, 1906. No. 75434.

Reinforced Concrete Suburban Residence Construction. William F. Tubesing. Illustrates two residences in the vicinity of Cincinnati, O., describing one in detail. 1100 w. Eng News—March 1, 1906. No. 75302.

The Design of Concrete Steel Beams and Slabs. Edward Godfrey. Aims to show that formulas for concrete-steel beams or slabs can be made as simple as those for steel beams. Discusses principles of design. 4000 w. Eng News—March 15, 1906. No. 75528.

The Determination of the Sliding Resistance in Reinforced Concrete Beams. Prof. Ramisch, in *Zeitschr. d. Oesterr. Ing. Arch. Ver.* Discusses the proper method for the determination. 2000 w. Cement—March, 1906. No. 75613 C.

The Northwestern Ohio Bottle Company's Factory. Illustrates and describes a main building and a coal shed of the Ransome reinforced concrete construction. 1600 w. Eng Rec—March 24, 1906. No. 75688.

The Reinforced Concrete Factory for the American Oak Leather Co., Cincinnati. Sanford E. Thompson. Illustrated description of structural details of inter-

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est. 2500 w. Eng Rec—March 3, 1906. No. 75412.

The Shearing Resistance of Reinforced Concrete. S. Zipkes. Describes tests conducted by the writer dealing with the shearing resistance of plain and reinforced concrete. Ills. 1800 w. Cement—March, 1906. Serial. 1st part. No. 75612 C.

Ferro Concrete. H. Kestner. Read at meeting of the Inst. of Mech. Engrs., Johannesburg. Discusses the qualities which give this material advantages as compared with ordinary constructions, and the precautions necessary to secure satisfactory results. 5000 w. Archt, Lond.—June 22, 1906. No. 77772 A.

Reinforced Concrete in the New San Francisco Building Law. Gives the portions of the new building law relating to buildings with self-supporting walls and metal frames carrying the floors only. 1800 w. Eng News—July 26, 1906. No. 78235.

Results of Plain and Reinforced Concrete Column Tests at Watertown Arsenal. James E. Howard. Read at meeting of the Am. Soc. for Test. Mat. Diagrams, and discussion of certain features of tests in progress, tending to show that high ultimate strength may be reached by each of the three methods considered. 1600 w. Eng News—July 5, 1906. No. 77823.

The Adhesion of Concrete to Steel. Editorial on the investigations and results for the purpose of ascertaining values of the adhesion between concrete and embedded bars of iron and steel. 1700 w. Builder—June 30, 1906. No. 77872 A.

The Comparative Advantages of Hard and Soft Steel for Reinforced Concrete. Daniel B. Luten. Presents the arguments given by both sides and concludes that neither presents any marked advantage over the other for reinforcement. 2300 w. Eng News—July 19, 1906. No. 78068.

The Design of Reinforced Concrete Columns and Footings. Edward Godfrey. Supplementing an earlier paper on the "Design of Reinforced Concrete Beams and Slabs." 3000 w. Eng News—July 12, 1906. No. 77925.

The Determination of the Best Proportions for Reinforced-Concrete Beams (Die Bestimmung der Wirtschaftlich Günstigsten Abmessungen von Eisenbetonbalken). R. Saliger. An examination of beams, reinforced for tension and for compression stresses, with tables for practical computation. 4000 w. Oesterr

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Wochenschr f d Oeffent Baudienst—July 7, 1906. No. 78161 D.

Instructions to Inspectors on Reinforced Concrete Arch Construction. Instructions submitted by George P. Carver, Division Engineer, Florida East Coast Ry. 1200 w. Eng News—Aug. 30, 1906. No. 78902.

Fire-Resistance of Buildings Constructed with Reinforced-Concrete. James Sheppard. Read at the Milan Int. Fire Congress. Considers the things essential to make this material reliable as a fire resistant. 2000 w. Am Archt—Aug. 4, 1906. No. 78421.

Reinforced Concrete Gas-Holder Tank for the Key City Gas Co., Dubuque, Iowa. Illustrated description of the construction work. 1800 w. Eng News—Aug. 9, 1906. No. 78531.

Tests of Reinforced Concrete Beams. Arthur N. Talbot. An analysis of the methods of failure restricted to rectangular beams with reinforcement on the tension side only, and refers generally to simple beams free from end restraints. 7000 w. Cement—July, 1906. No. 78-363 C.

A Knotty Problem in Stress-Analysis; Dangerous "Safe Stresses" in a Reinforced Concrete Bridge. Gives letters from Daniel B. Luten concerning a bridge that failed, with report on the failure. Ills. 2800 w. Eng News—Sept. 27, 1906. No. 79474.

A Rapid General Method for the Calculation of Reinforced Concrete Sections. Richard T. Dana. Presents formulas and diagrams which the writer believes will result in a considerable saving of time. 2700 w. Eng Rec—Sept. 1, 1906. No. 78931.

Cost Reduction of Reinforced Concrete Work. E. P. Goodrich. Extracts from a paper before the Am. Soc. of Port. Cement Mfrs. A discussion of the ways in which economy can be secured. 5000 w. Munic Engng—Sept., 1906. No. 79271 C.

Failure of a Reinforced Concrete Building. A report of the failure of a factory at Elyria, Ohio, while in process of construction. Ills. 1000 w. Ir Trd Rev—Sept. 13, 1906. No. 79180.

Hard and Mild Steel in Reinforced Concrete. Discusses these materials, concluding that it really matters little which is used. 2000 w. Engng—Aug. 24, 1906. No. 79012 A.

Reinforced Concrete in the San Francisco Fire. Editorial review of the recently published book on the San Fran-

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cisco fire and its lessons, by A. L. A. Himmelwright, which is being much discussed. 3000 w. Eng News—Sept. 27, 1906. No. 79473.

Tests of the Effect of Heat on Reinforced Concrete Columns. H. B. MacFarland. An illustrated article giving details of some interesting experiments recently made at the Chicago Laboratory of the National Fireproofing Co. Ills. 2000 w. Eng News—Sept. 20, 1906. No. 79287.

The Progress and Logical Design of Reinforced Concrete. Ross F. Tucker. Reviews the progress of this material since 1885, giving suggestions for economical designs, and discussing its durability. Ills. 2000 w. Cement Age—Sept., 1906. No. 79259.

Reinforced Concrete Buildings for a Paper Mill. Illustrates and describes a group of large buildings recently completed at Bogota, N. J. 2500 w. Eng Rec—Oct. 27, 1906. No. 80110.

Reinforced Concrete Construction. Walter Mueller. Presents its advantages as a structural material for factories, with illustrated description of reinforcing systems. 5500 w. Cement Age—Oct., 1906. No. 79860.

The Coignet Reinforced-Concrete System. Information concerning the methods used by this French engineer. 2000 w. Am Archt—Sept. 29, 1906. No. 79538.

The Design of Continuous Beams in Reinforced Concrete. John Stephen Sewell. A statement of the writer's opinion, and the reasons for it. 1500 w. Eng News—Oct. 25, 1906. No. 80091.

A Garage of Reinforced Concrete. Illustrated description of a building in West 93d St., New York, designed as a public garage for the storage and care of automobiles. There are three floors and a basement. 800 w. Archts & Bldrs Mag—April, 1906. No. 75916 C.

Computations for Ceilings and Beams in Reinforced Concrete (Calcul des Hourdis en Béton Armé). P. Cafourier. Deriving simple formulas for the distribution of reinforcing rods for various loads and spans. 1500 w. Génie Civil—April 7, 1906. No. 76220 D.

Recent Developments in Reinforced Concrete Construction. M. M. Sloan. Comments on the causes that have led to the rapid advance of reinforced concrete, discussing details, elementary principles, advantages and limitations. Ills. 2800 w. Archts & Bldrs' Mag—April, 1906. Serial. 1st part. No. 75917 C.

Reinforced Concrete Sand Bins. II

Illustrated description of a cluster of sand-storage bins, built in New York City of reinforced concrete. 100 w. Eng Rec—April 21, 1906. No. 76327.

Reinforced Concrete Work at the New Railway Terminal Station at Atlanta, Ga. Illustrated detailed description of a terminal station where this material has been used in a variety of ways. Also editorial. 4500 w. Eng News—April 12, 1906. No. 76049.

The Economical Design of Reinforced Concrete Floor Systems for Fire-Resisting Structures. Continued discussion of paper on this subject by John S. Sewell. 8400 w. Pro Am Soc of Civ Engrs—April, 1906. No. 76393 E.

The Reinforced Concrete Bath House Failure at Atlantic City, N. J. Photographs, with description of the causes which led to the failure. 600 w. Eng News—April 5, 1906. No. 75953.

Economies in the Use of Reinforced Concrete. E. P. Goodrich. Discusses various methods of reducing cost; a solution of the centering problem; and the use of under steels and adaptability of the molds. Ills. 2500 w. Cement Age—May, 1906. Serial. 1st part. No. 76517.

Suggested Plans for Reinforced Concrete Earthquake-Resisting Fireproof Building Construction. Editorial discussion of the behavior of this material in the recent California earthquake and fire, and its use for building construction, with a letter from John Hawkesworth. 3000 w. Eng News—May 24, 1906. No. 76784.

The Advantages and Limitations of Reinforced Concrete. Summary of a paper by Charles S. Hill read before the Portland Cement Mfrs., reviewing the merits and defects of this material. 1000 w. Sci Am—May 12, 1906. No. 76626.

The Rational Proportioning of Structures in Ferro-Concrete. Gives a note concerning methods of verifying the dimensions proposed for armored concrete works on the Coignet system, which may also be applied to other systems. 1500 w. Engng—May 4, 1906. No. 76670 A.

Typical Systems of Reinforced Concrete Construction. Remarks on the adaptability and economy of this material, with illustrated descriptions of typical systems of construction. 4000 w. Sci Am—May 12, 1906. No. 76627.

A British Investigation of Reinforced Concrete. Statement issued by a joint committee representing the Royal Inst. of British Archts., the District-Surveyors' Assn., the Inst. of Builders, the

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## Roads

Assn. of Munic. & Co. Engrs. and the War Office. 1800 w. Eng Rec—June 16, 1906. No. 77341.

Design of a Long Reinforced Concrete Girder. Frank H. Constant. Description and method of computation employed in the design of two 60 ft. reinforced concrete girders supporting a roof over a ball-room. 3500 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77514 N.

Building Code for Reinforced Concrete. Section 110 from the "Building Code" recommended by the National Board of Fire Underwriters, which gives a standard for concrete construction. 2000 w. Am Archt—June 9, 1906. No. 77179. "Ferro-Concrete." Sven Bylander. Read before the Soc. of Engrs. An illustrated article considering the best known systems of reinforced-concrete construction, and the methods of approximately ascertaining the stresses. 5500 w. Ir & Coal Trds Rev—May 25, 1906. No. 77149 A.

General Notes on the Theory of Reinforced Concrete Design. R. V. Engstrom. Discusses the interesting phases of this new material, the stresses, the relation of stresses and dimensions, etc. Ills. 2500 w. Technograph—No. 20. No. 77165 D.

Reducing the Cost of Centering and Form in Reinforced Concrete Building Work. Editorial remarks on economical form work. 1400 w. Eng News—June 14, 1906. No. 77439.

Reinforced Concrete and Fireproof Construction in the San Francisco Disaster. Maurice C. Couchot. A report of the condition of these buildings after the earthquake and fire, and suggestions for fireproof construction. 1000 w. Eng News—June 7, 1906. No. 77242.

Reinforced Concrete Bar. A steel bar for reinforced concrete, known as the "Johnson," is illustrated and described, and tests made are reported. Illustrations of practical applications are given. 1600 w. Engr, Lond—June 8, 1906. No. 77391 A.

Reinforced Concrete. Robert A. Cummings. Briefly considers the reasons for steel being embedded in concrete, the materials which compose concrete, the proportions, mixing, etc., methods of erection and applications. General discussion. 10000 w. Pro Ry Club of Pittsburgh—Feb., 1906. No. 77292 C.

See also Civil Engineering, Materials.

See also Civil Engineering, Bridges.

## Retaining Walls.

Concrete Retaining Wall and Tunnel. Herbert I. Bennett. Illustrated description of a tunnel through the Santa Cruz Mountains, which has stood eleven years without showing the least sign of cracks or other failure. 1000 w. Sci Am Sup—Jan. 13, 1906. No. 74391.

Heavy Concrete Retaining Walls, Illinois Central R. R. An illustrated description of the construction of a concrete retaining wall in connection with the improvements being carried out by the South Park Commissioners of Chicago. 2000 w. Eng Rec—Jan. 27, 1906. No. 74765.

Plumbing a Leaning Retaining Wall and Bridge Abutment. Lindsay Duncan. Illustrates and describes work on a viaduct at Pueblo, Colo. 600 w. Eng News—April 5, 1906. No. 75951.

Difficult Reinforced Concrete Retaining Wall Construction on the Great Northern Railway. C. F. Graff. Illustrates and describes the methods pursued in building the retaining wall and fill at Bridge 123, which is 25 miles west of Summit, Montana. 5700 w. Eng News—May 3, 1906. No. 76472.

Masonry Retaining Walls (Murs de Soutènement en Maçonnerie). F. Chaudy. Describing a peculiar form of retaining wall, with spurs or projections of reinforced concrete extending back into the earth behind. 2000 w. Mem Soc Ing Civ de France—March, 1906. No. 78138 G.

The Design of Reinforced Concrete Retaining Walls. Edward Godfrey. Treats of a wall to retain ordinary fill or prevent natural earth from slipping. Diagrams. 3000 w. Eng News—Oct. 18, 1906. No. 79831.

## Revetment.

Concrete Revetment for a 200-Foot Cliff, Niagara River Gorge, Niagara Falls, N. Y. Illustrated description of a revetment being built for the rock cliff. 500 w. Eng News—Nov. 2, 1905. No. 72960.

## Roads.

Construction of the Benguet Road, Luzon, Philippine Islands. Illustrates and describes a notable piece of highway construction through rough country, and under exceptionally hard conditions. 2500 w. Eng Rec—Dec. 23, 1905. No. 74015.

County Road Construction. A topical discussion. 4000 w. Pro Engrs' Soc of W Penn—Jan., 1906. No. 74541 D.

The Office of Public Roads. Excerpt from the report for 1905 of Hon. James Wilson, Secretary of Agriculture. Gives

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## Roofs

an idea of the work undertaken and the results attained up to the present time. 3800 w. Eng Rec—Jan. 27, 1906. No. 74771.

Building a Marsh Highway near New York. Illustrated description of the construction of a road through a salt meadow, which is a part of an inlet from Long Is. Sound. 1200 w. Eng Rec—March 3, 1906. No. 75390.

Mountain Road Construction in Idaho. E. B. Darlington. An account of a system inaugurated to build mountain roads on engineering principles, and planned along systematic lines. 1800 w. Eng News—March 15, 1906. No. 75522.

The Corniche Road in the Maritime Alps (La Corniche de l'Estérel). M. Thérél. A historical and technical description of the construction of the famous Corniche road along the Riviera in the South of France. 1500 w. 2 plates. Ann d Ponts et Chaussées—2 Trimestre, 1905. No. 75770 E + F.

Good Roads. Frank Soule. Points out benefits derived from good roads, considers some of the characteristics such roads should possess, and urges improvement of the roads in California. 3300 w. Cal Jour of Tech—Feb., 1906. No. 73958 C.

The Drainage of Earth Roads. Abstract of a Bulletin by Prof. Ira O. Baker, published by the University of Illinois. Considers tile drainage, side ditches, surface drainage, and maintenance. 4500 w. Eng Rec—May 5, 1906. No. 76525.

A Road Drag for Improving Earth Roads. Abstract of Bul. No. 1 of the Illinois State Highway Commission, describing the good results and methods of dragging to improve roads, and the simple drags used. 1200 w. Eng News—June 14, 1906. No. 77442.

Laboratory Tests for Road Metals. William R. Hoag. Introductory review of early methods of road construction, and description of machines for determining the comparative value of different materials used in highway construction. 2500 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77512 N.

The Development of the Test for the Cementing Value of Road Material. Allerton S. Cushman. Read before the Am. Soc. for Test. Mat. An account of the attempts made to test the cementing value, and the results. 2000 w. Eng Rec—June 23, 1906. No. 77429.

The Adhesion of Concrete to Steel as Affected by the Quantity of Water Used in Mixing. R. Feret. An account of

experiments by the writer, with tabulated results, and notes. 2000 w. Cement—May, 1906. No. 77033 C.

Experiments with Tar and Oil for Roads at Jackson, Tenn. Describes methods used and excellent results obtained with tar, giving the cost. Also the results obtained with oils and the cost. 2800 w. Eng Rec—June 30, 1906. No. 77725.

The Construction of Mountain Pass Roads in Cape Colony, South Africa. R. Bromley. Describes the difficulties of the early settlers in crossing the mountains, and the modern method of mountain pass road construction. Ills. 1500 w. Eng News—Aug. 2, 1906. No. 78391.

The Organization and Equipment of the Office of Public Roads, United States Department of Agriculture. An explanation of the work of the National Government in the improvement of public roads is given. 2500 w. Eng Rec—Aug. 25, 1906. No. 78805.

The Construction and Maintenance of Rural Roads. Part of a paper by Robert Phillips read before the Roy. San. Inst. Describes Macadam's and Telford's methods of construction, and discusses maintenance. 2000 w. Builder—Sept. 1, 1906. No. 79107 A.

## Rock-Cutting.

Sub-Aqueous Rock-Cutting. Illustrated description of a recently built rock-cutting plant, and report of results achieved. 3300 w. Engng—Aug. 17, 1906. No. 78850 A.

## Roofs.

Notes on the Concert Hall at Zürich (A Propos de la Halle des Concerts de Zurich). Prof. B. Recordon. Discussing especially the design of framed timber roofs of large span; the Zurich concert hall is covered by a braced arch of 50 metres clear span. 3500 w. 1 plate. Bull Tech de la Suisse Rom—Nov. 10, 1905. No. 73877 D.

Temporary Structures in Wood (Halles Provisoires en Bois). A description of recent buildings in Switzerland, covered by timber roofs of large span. 1000 w. Génie Civil—Dec. 16, 1905. No. 74624 D.

The Catastrophe at Charing Cross. Editorial on the accident at Charing Cross Station, when two bays of the large roof collapsed without any apparent reason. 1200 w. Engng—Dec. 8, 1905. No. 73907 A.

The Charing Cross Disaster. Editorial on the verdict given at the coroner's inquest as to the cause of the disaster, showing that the roof collapsed owing to the

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breakage of a tie-bar which had a concealed flaw. Ills. 1500 w. Engng—Jan. 12, 1906. No. 74525 A.

The Lesson of the Charing Cross Accident. Editorial discussing whether iron and steel ought to be regarded as permanently trustworthy materials of construction. Gives drawings and a brief description of the main constructional features of the Charing Cross station, with added information. 4800 w. Builder—Dec. 23, 1905. No. 74123 A.

The Timbering of the Charing Cross Station Roof. Illustrations showing the work in progress at the station, with brief description. 600 w. Engng—Dec. 29, 1905. No. 74296.

Traveling Stages for Removal of Roof at Charing Cross Station. Illustrates and describes the method of removing this large roof and replacing by a different type, without interrupting traffic. 800 w. Engng—March 9, 1906. No. 75601 A.

The Charing Cross Roof. Remarks about the cause of the accident as given in the report of Major J. W. Pringle. 2200 w. Archt, Lond—June 22, 1906. No. 77773 A.

The Disaster at Charing Cross Railway Station. A review of Major Pringle's report to the Board of Trade concerning the fall of roof and its causes. Ills. 2200 w. Ir & Coal Trds Rev—June 22, 1906. No. 77791 A.

Difficult Reconstruction of a Church Roof. Describes the original design and shows how changes made in the building weakened the framework, and gives an illustrated description of difficult repairs, made without injuring the costly interior decorations. 2500 w. Eng Rec—March 31, 1906. No. 75884.

For Good Tin Roofing. W. B. Goddard. A discussion of the kind of material, preparation, application and finishing, with comments. 3000 w. Met Work—May 12, 1906. No. 76594.

Moving and Raising an Old Wood and Iron Roof. Describes an interesting piece of work in connection with alterations at the Riding Club, 59th St., New York City. Ills. 1000 w. Eng Rec—April 28, 1906. No. 76418.

Short Cuts in the Design of Roof Howe Trusses. Benjamin E. Winslow. Gives the results of an investigation to see if it is possible to design a few standard Howe trusses for ordinary flat gravel roofs. Diagrams and tables. 1200 w. Technograph—No. 20. No. 77164 D.

A Practical Talk on Roofing. Dis-

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cusses how to put on good tin roofs, the conditions, workmanship, etc. Ills. 2800 w. Met Work—July 14, 1906. No. 77902.

Ferrocinclave Roof Construction. Alexander E. Brown. An account of the circumstances that led to the design of this type of roof, giving tabulated tests made of the material. Ills. 2400 w. Pro Am Soc of Mech Engrs—Oct., 1906. No. 79857.

Saw-Tooth Skylight in Factory Roof Construction. Fred S. Hinds. Illustrates and describes the construction methods. 2500 w. Pro Am Soc of Mech Engrs—Oct., 1906. No. 79858.

The Development of Iron and Steel Roof Design. Reviews the history of iron roof construction briefly and discusses the Charing Cross Station roof, and other examples. 3000 w. Builder—Sept. 22, 1906. Serial. 1st part. No. 79572 A.

## Safety.

Factors of Safety. Editorial, giving an analysis of the elements of factors of safety, discussing the material, the structure or composition, and the loads or attack in service, and other influences. 2800 w. Eng News—Sept. 6, 1906. No. 79097.

## Sanitation.

Sanitary Building Construction. Alfred Saxon Snell. Read before the Roy. San. Inst. Discusses conditions affecting the health that should be considered in building. 4000 w. Plumb & Dec—March 1, 1906. No. 75539 A.

## San Francisco.

Comments of Californian Engineers on the Earthquake and Fire. Edward M. Boggs. Notes on the destruction, and damage, with illustrations showing effects. 3200 w. Eng Rec—May 5, 1906. No. 76523.

Comments of Californian Engineers on the Earthquake and Fire. An account of the earthquake, by Prof. Frank Soule, with short notes from a number of writers. Ills. 2800 w. Eng Rec—May 12, 1906. Serial. Part I. No. 76648.

Effects of the Earthquake and Fire Upon the City of San Francisco and Its Buildings. Brief illustrated account. 1200 w. Sci Am—May 19, 1906. No. 76688.

Injuries by Earthquake to the Buildings of Stanford University. Gives an official statement, with illustrations, showing the damage to these buildings. 1500 w. Eng News—May 10, 1906. No. 76617.

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Notes on the Californian Earthquake. Reports from Carl Leonardt, by the State Board of Architects, and by the Home Fire Insurance Co. Ills. 2000 w. Eng Rec—May 19, 1906. No. 76733.

San Francisco in Ruins. General views and maps with an account of the devastation wrought by earthquake and fire. 8000 w. Ins Engng—May, 1906. No. 76795 C.

Some Effects of the San Francisco Earthquake on Water-Works, Streets, Sewers, Car Tracks and Buildings. Charles Derleth, Jr. An illustrated article showing the damage wrought, with explanation of the fault line along which the worst effects are found. 5800 w. Eng News—May 17, 1906. No. 76683.

Some Lessons from the Earthquake. S. B. Christy. Discusses principally the ruin due to the fire, and how much of it could have been avoided; offering suggestions for the rebuilding of the city on a safer and improved plan. 2000 w. Min & Sci Pr—April 28, 1906. No. 76637.

Some Views and Lessons of the San Francisco Disaster. An illustrated article showing the effects of earthquake and fire, and discussing the construction work that best stood the test. 2000 w. Sci Am—May 12, 1906. No. 76631.

The California Earthquake: Movements Along the Santa Cruz Fault Line. John C. Branner. Explains the geology of the region, showing that the earthquake disturbance was due to the geological structure. 700 w. Eng News—May 17, 1906. No. 76682.

The Cause and Nature of Earthquakes. G. K. Gilbert. Remarks on the origin of earthquakes and the nature of the vibrations. 800 w. Min & Sci Pr—April 28, 1906. No. 76636.

The Earthquake at San Francisco. W. G. Mitchell. An interesting account of the damage as viewed by the writer. 3000 w. Am Archt—May 19, 1906. No. 76712.

The Effect of the California Earthquake on Reinforced Concrete. John B. Leonard. Illustrations of buildings, with facts concerning them, showing the reliability of this material. 2000 w. Eng Rec—May 26, 1906. No. 76956.

The Effect of the Earthquake at Stanford University, Cal. Prof. Charles D. Marx. Gives the report of the examining committee on the condition of the buildings. Ills. 1200 w. Eng Rec—May 12, 1906. No. 76647.

The Recent Earthquake in Central Cali-

fornia and the Resulting Fire in San Francisco. J. D. Galloway. An illustrated account of the damage wrought, and the effect on different classes of structures. 2000 w. Eng News—May 10, 1906. No. 76622.

The Saving of the Western Electric Building at San Francisco. Describes the construction of this building which withstood the recent earthquake and fire with very little damage. 1800 w. Eng Rec—May 12, 1906. No. 76649.

Report of the National Board of Fire Underwriters on the San Francisco Conflagration. Extracts from this report, dealing mainly with the effects of the fire on the so-called "fireproof" class of buildings. 9000 w. Eng News—Aug. 9, 1906. No. 78532.

The San Francisco Lesson. F. W. Fitzpatrick. Begins a discussion of building construction and gives illustrations showing how the different constructions stood the earthquake and fire. 1600 w. Sci Am Sup—Aug. 18, 1906. Serial. 1st part. No. 78625.

## Shoring.

Difficult Shoring Work for Buildings in Chicago. Explains conditions and illustrates and describes difficult work in erecting the Boston Store in the retail business district. 2700 w. Eng Rec—March 24, 1906. No. 75686.

## Sluicing Gates.

High Pressure Sluicing Gates. M. O. Leighton. An explanation of the designs for the sluicing gates for the Roosevelt dam, and the Shoshone dam, and one of the designs under discussion for the Pathfinder dam, with comparison with the New Croton and Wachusett dams. Ills. 2500 w. Jour W Soc of Engrs—Aug., 1906. No. 78888 D.

## Specifications.

Iron and Steel Structures. Abstract of a report presented at meeting of the Am. Ry. Engng. & Main. of Way Assn., with general discussion. Considers specifications for steel bridges, loads, strains, designs, &c. 23500 w. Ry Age—March 23, 1906. No. 75821.

## Steel Details.

Some Steel Details in the Wanamaker Building, New York. Outline description of this building, with special notes on the framing. 1200 w. Eng Rec—June 30, 1906. No. 77721.

## Steelwork.

Steelwork of the Ash Plant of the New York Edison Co. Illustrated detailed description of this plant in New York, which contains 350 tons of structural

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steel. 1800 w. Eng Rec—Dec. 9, 1905. No. 73674.

Steel Work in the Aphorpe Apartment House. A thirteen story apartment house, occupying a full city block in New York is described in detail. 2200 w. Eng Rec—Aug. 25, 1906. No. 78804.

## Steel Structures.

San Francisco Buildings after the Disaster. Reports favorably concerning the resistance of steel structures to earthquake and fire, and some plans for reconstruction. 3000 w. Ir Age—April 26, 1906. No. 76321.

Steelwork Details of the New Office Building of the New York Central R.R. Describes interesting details of the building under construction at Depew Place, New York City, where arrangements have been made for very heavy loads. 2500 w. Eng Rec—April 7, 1906. No. 75987.

Structural Steel Work in a New York Office Building. Illustrates and describes the construction of one of the tallest of steel-cage structures in New York City. 2200 w. Eng Rec—April 14, 1906. No. 76316.

## Stone Masonry.

Decay of Stone Masonry. J. W. Dougal, in the Glasgow *Herald*. Considers some causes of decay other than those best known, and the prevention. 1200 w. Ry & Engng Rev—Feb. 17, 1906. No. 75042.

## Substructure.

The Substructure of the Edison Building. Detailed description of the substructure of a steel-cage structure in New York City, where the soil has many of the characteristics of quicksand, requiring great care in the bracing of adjacent buildings. 1500 w. Eng Rec—Aug. 25, 1906. No. 78809.

## Subways.

Mail Handling Facilities of the Chicago Freight Tunnels. Illustrates and describes the arrangements made, especially the construction of a tunnel to run under the post-office where the mails may be loaded and unloaded. 1000 w. R R Gaz—Vol. XXXIX., No. 25. No. 74014.

Rapid Transit Subway Construction on Fulton St., Brooklyn. An account of the change in plans to a four-track structure, with illustrated description of construction work. 2300 w. Eng Rec—Dec. 23, 1905. Serial. 1st part. No. 74016.

See Street and Electric Railways.

## Tall Buildings.

American Tall Buildings or Sky-Scrapers (Amerikanische Hochbauten Sogenannte Wolkenkratzer). F. Bohny.

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An illustrated description of the tall business buildings of the United States, with especial reference to Chicago and New York. Serial, part 1. 3500 w. Zeitschr d Ver Deutscher Ing—Feb. 24, 1906. No. 75704 D.

A 40-Story Building in New York City. Illustrates and describes changes to be made in the Singer buildings, corner of Liberty St. and Broadway, New York City. 2000 w. Eng Rec—Sept. 8, 1906. No. 79032.

An Office Building 612 Feet Tall—The Loftiest Masonry Structure in the World. Illustrations of the Singer tower to be built in New York City, with description. 1200 w. Sci Am—Sept. 8, 1906. No. 79079.

## Trusses.

Two-Hinged Arch Trusses for the New Livestock Pavilion, Chicago. Gives sketch plan and diagrams of this new hall for exhibition uses, describing the features of special interest. 1300 w. Eng News—June 28, 1906. No. 77530.

## Tunnels.

I. Alfreton Second Tunnel. Ernest Frederick Crosbie Trench. (No. 3380.)

II. The Reconstruction of Moncreiffe Tunnel. Dugald McLellan. (No. 3498.) With an abstract of the discussion on the two papers. Illustrated descriptions of the construction work. 22500 w. Inst of Civ Engrs. No. 73155 N.

Timber Tunneling in Quicksand. Rufus K. Porter. Describes in detail the method employed in constructing a sewer in the city of Newton, Mass., 500 ft. of which was built in timbered tunnels. Also general discussion. 5500 w. Jour Assn of Engng Soc's—Aug., 1905. No. 73029 C.

Tunnel Boring in Ancient Palestine. Brief account of tunnels built 2,500 years ago by means of which water was brought to ancient cities. 600 w. Sci Am—Nov. 4, 1905. No. 72965.

The Crowning Work of the Simplon Tunnel. Drawings and engravings showing the means employed for the very difficult operation of constructing the passage through 40 m. of saturated decomposed clay slate. 1600 w. Engr, Lond—Dec. 8, 1905. No. 73911 A.

The Construction of the Simplon Tunnel (Der Bau des Simplon tunnels). F. Pflug. Including a description of the surveys, rock drilling machinery and masonry work. Serial, Part I. 2000 w. Glasers Annalen—March 15, 1906. No. 75753 D.

The Construction of the Simplon Tunnel (Les Travaux du Tunnel du Simplon). M. Jacquier. A general descrip-



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tion of the undertaking and its difficulties; reviewing the engineering peculiarities of the work, with statistics of the execution. 20000 w. 1 Plate. Ann d Ponts et Chaussées—4 Trimestre, 1905. No. 75777 E + F.

The Construction of the Simplon Tunnel (Der Bau des Simplon tunnels). C. J. Wagner. A general review of the whole Simplon-tunnel project, with a tabular view of the execution of the work, to its completion. 8000 w. Oesterr Wochenschr f d Oeffent Baudienst—June 2, 1906. No. 77623 D.

The Construction of the Simplon Tunnel (Die Bauarbeiten am Simplon tunnel). Dr. K. Pressel. A very full account of the building of the Simplon tunnel, with topographical map, and detailed plans, sections, and records of the work. Serial. Part I. 2500 w. 1 Plate. Schweiz Bauzeitung—May 26, 1906. No. 77619 B.

The Simplon Tunnel (Le Tunnel du Simplon). E. Lemaire. A well illustrated account of the design and execution of the Simplon tunnel, and a comparison of its facilities with those of the other Alpine tunnels. Two articles, 7500 w. 1 plate. Génie Civil—June 23, 30, 1906. No. 78122 each D.

The Simplon Tunnel (Per l'Apertura del Sempione). Gustavo Coen. A review of the new commercial routes rendered available by the completion of the new route through the Alps. Two articles, 12,000 w. Rivista Marittima—April, May, 1906. No. 78185 each H.

Working of the Simplon Tunnel. Notes on the tunnel and its approach lines, the ventilation, temperature, etc. 1500 w. Engr, Lond—June 22, 1906. No. 77797 A.

Progress in the New Jersey Tunnels and Subways. Information concerning the tunnels connecting Jersey City and New York. Ills. 1500 w. Sci Am—Dec. 9, 1905. No. 73632.

The Hudson River Tunnels. Brief accounts of three pairs of tunnels being extended under the Hudson River between New York and Jersey City. 1700 w. Ir Age—Dec. 7, 1905. No. 73580.

Troubles with East River Tunnels. S. D. V. Burr. Describes the troubles from blowouts, and from distortion in the tubes being placed under the East River at New York, and the methods of overcoming the difficulties. 1200 w. Ir Age—May 24, 1906. No. 76770.

Report on the Defects of the Brooklyn Tunnels of the New York Rapid Transit Ry. Gives the report of George S. Rice. 2500 w. Eng News—May 31, 1906. No. 77043.

The New York & Long Island Railroad Tunnel. Information concerning the laying out of a double-track tunnel under the East River in the line of 42d St., New York, which is intended to bring electric cars from Long Is. to a point under the Grand Central Station and the Rapid Transit Subway Station. 3800 w. Eng Rec—March 3, 1906. No. 75393.

Handling Spoil from City Tunnel Workings. Illustrated description of a telfer hoist equipment and a new type of quick dumping skip used in connection with tunnel work in New York City. The operation is entirely noiseless, which is of importance as the work goes on night and day in the residence district. 2000 w. Eng Rec—June 16, 1906. No. 77345.

Grade Corrections in the Battery Tunnel, New York. Brief description of the tunnel under construction to connect the subway systems in the Boroughs of Manhattan and Brooklyn, with an explanation of the irregularities and their causes, and a discussion of proposed methods of reconstruction. 2400 w. Eng Rec—June 2, 1906. No. 77070.

Steel Cofferdam for a Hudson River Tunnel Shaft. Illustrates and describes work in connection with the construction of the elevator shaft to the Hudson tunnel between Jersey City and Manhattan. 900 w. Eng Rec—June 2, 1906. No. 77073.

The Construction of the East River Division of the Pennsylvania, New York and Long Island Railroad Company's Tunnels. Begins a full account of the work as it now stands, the difficulties met, etc. Also editorial. Ills. 4800 w. Eng Rec—July 14, 1906. Serial. 1st part. No. 77934.

The East River Tunnels for the New York City Terminus of the Pennsylvania and Long Island Railroads. Describes interesting features of the construction work. 2300 w. Eng Rec—July 7, 1906. No. 77836.

The Pennsylvania Tunnels Under the East River. A brief description of the methods employed in driving the tunnels and the working plant of the contractors. Ills. 7000 w. R R Gaz—July 6, 1906. Serial. 1st part. No. 77813.

The Tunnel Work of the Pennsylvania Railroad Under the East River. Concerning the construction of the two twin-tube shield-driven tunnels, the compressed air work, shaft construction, shield construction, etc. 3800 w. Eng News—July 12, 1906. No. 77929.

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Tunneling by the Freezing Method Under the East River. An account of an experiment in progress by the Pennsylvania R. R. with a new system of freezing the moist material so that no air pressure will be require. 1600 w. Sci Am—July 14, 1906. No. 77930.

Tunneling the East River. An illustrated article describing the methods used in constructing the Pennsylvania R. R. tunnels. 2300 w. Sci Am—Aug. 4, 1906. No. 78425.

Grade Rectification in the Battery Tunnel, New York. Describes the work of rebuilding the imperfect portions of the East River tunnel of the New York Rapid Transit Railway. Ills. 1500 w. Eng Rec—Sept. 29, 1906. No. 79555.

Recent Tunnel Construction of the Rapid Transit Railroad in Brooklyn. Illustrated description of the section from Court to Clinton St., where the subgrade was from 33 to 52 feet below the surface, and the conditions difficult. 4500 w. Eng Rec—May 12, 1906. No. 76650.

Tunnel Construction on Salt River Reclamation Project, Arizona. Beverly R. Harrison. Briefly describes some difficult tunnel work. Ills. 1200 w. Eng Rec—Dec. 16, 1905. No. 73919.

Construction of Indigo Tunnel, Western Maryland R. R. Describes the construction of this tunnel, driven through very dense rock which did not require timbering. The method of driving the lower heading first and then taking the remainder above in a single lift is explained. 1800 w. Eng Rec—Jan. 27, 1906. No. 74768.

Scranton Tunnel of the Lackawanna & Wyoming Valley. An illustrated description of this tunnel on the third-rail electric line between Scranton and Wilkesbarre, Pa. 800 w. R R Gaz—Vol. XL. No. 2. No. 74329.

The Scranton Tunnel of the Lackawanna and Wyoming Valley Railroad. George B. Francis and W. F. Dennis. Illustrates and describes the construction of this tunnel which contains many interesting engineering features. 7000 w. Pro Am Soc. of Civ. Engrs—March, 1906. No. 75833 E.

The Remarkable Tunnel Crossing of the Seine by Line 4, Metropolitan Railway of Paris. Brief illustrated description of tunnel formed of sections constructed as caissons and sunk end to end to grade. 1200 w. Eng News—Feb. 15, 1906. No. 75018.

Construction of a Subway Tunnel Under the River Seine in Paris. E. Omme-

lange. Illustrated description of the construction of a single-tube, double-track tunnel, at an estimated cost of \$3,100,000. 1400 w. R R Gaz—Vol. XL, No. 7. No. 75025.

The Detroit River Tunnel of the Michigan Central. Gives details of the modified plan adopted. 1500 w. Ry Age—Sept. 7, 1906. No. 79072.

The Detroit River Tunnel of the Michigan Central. Map and illustrated detailed description of the proposed railroad tunnel. Four methods are included in the specifications, any one of which may be used. 3000 w. R R Gaz—Vol. XL, No. 7. Serial. 1st part. No. 75021.

The Proposed Tunnel Under the Detroit River for the Michigan Central R. R. An illustrated description of plans worked out for this railroad tunnel, any one of which may be taken by bidders, or he may present plans of his own. 4000 w. Eng News—Feb. 15, 1906. No. 75019.

The Reconstruction of the Ossining Tunnel, New York Central R. R. Illustrates and describes the method of carrying out these improvements without interrupting the heavy traffic of freight and express trains. 2500 w. Eng Rec—March 3, 1906. No. 75392.

Construction of the Gallitzin Tunnel on the Pennsylvania Railroad. Illustrated detailed description of the construction of this new tunnel for west bound trains. 2400 w. Eng Rec—May 5, 1906. No. 76526.

Relining the Allegheny Tunnel, Pennsylvania R. R. Illustrates and describes extensive repairs and the method of carrying them out. 1300 w. Eng Rec—May 12, 1906. No. 76651.

Driving a Tunnel. An illustrated account of ancient and modern methods of constructing tunnels. 2000 w. Ry & Loc Engng—June, 1906. No. 77101 C.

Notes on Great Tunnels. Lewis M. Haupt. On the recent development in tunnel construction, giving a brief chronological statement of the statistics and time of construction of the several long railroad tunnels, and other important structures. Ills. 3500 w. Jour Fr Inst—June, 1906. No. 77322 D.

The Piercing of the North End of the Karawanka Tunnel (Der Sohlstollen-vortrieb bei dem Bau des Karawankentunnels, Nord.) Jos. Fischer. Describing the piercing of the Karawanken mountains by the tunnel to connect Trieste with the interior of Austria-Hungary, including the results of the use of electric rock drills. 4500 w. 1 plate. Oesterr

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Wochenschr f d Oeffent Baudienst—June 9, 1906. No. 77624 D.

The Completion of the Northern Section of the Karawanka Tunnel (Der Vollausbruch beim Baue des Karawankentunnels, Nord). Jos. Fischer. Illustrating and describing the method of enlarging the original small bore to the full section for the completed tunnel. 3000 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Sept. 29, 1906. No. 79980 D.

The Piercing of the Eastern Alps (Il Traforo delle Alpi Orientali). Emilio Gerli. A discussion of the relative advantages of the Splügen and the Greina routes. Three articles. 7500 w. Monitore Tecnico—April 30, May 10, 20, 1906. No. 77663 each D.

Single and Double Track Alpine Tunnels (Einspurige und Zweispurige Alpentunnel). Prof. Hennings. Describing a plan for boring a double track tunnel, with a small tunnel beneath for construction and ventilation. 1800 w. Schweiz Bauzeitung—June 16, 1906. No. 78141 B.

Construction Difficulties with the Bosruck Tunnel (Die Bauschwierigkeiten beim Bosrucktunnel), M. J. Blodnig. A general illustrated account of the work on the tunnel under the Bosruck from Ardnig to Emiliendorf, in the Styrian Alps. 3500 w. Zeitschr d Oesterr Ing u Arch Ver—June 22, 1906. No. 78158 D.

Lowering the Tunnels Under the Chicago River. Concerning the lowering of the three street railway tunnels under the Chicago River, and the methods proposed. Editorial explaining the necessity of the work and the advantages to be gained. 2000 w. Eng Rec—July 21, 1906. No. 78078.

Lowering the Tunnels Under the Chicago River. Briefly outlines the history of these tunnels and their construction, and gives an illustrated description of the methods of lowering them. 3500 w. Eng News—Sept. 13, 1906. No. 79169.

Boring Machines in the Bosruck Tunnel (Die Maschinelle Bohrung im Bosrucktunnel). Rudolf Heine. An illustrated description of the conduct of the work on the Bosruck tunnel on the Pyhrn railway in the Tyrol; with details of the Gatti rock drills, as well as the electric power machinery. 4000 w. Oesterr Wochenschr f d Oeffent Baudienst—Sept. 1, 1906. No. 79370 D.

The Scheme for a Tunnel under the English Channel (Le Projet de Tunnel sous la Manche). With plan and profile, discussing the difficulties of the work in the light of modern experience. 2000 w. Génie Civil—Sept. 8, 1906. No. 79324 D.

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The Double-Bore Method of Tunneling (Die Zweitunnelbaumethode). Karl Brandau. A discussion of the advantages of boring two separate tunnels instead of a single large bore, with illustrations from the work on the Simplon tunnel. 2500 w. Schweiz Bauzeitung—Sept. 22, 1906. No. 79972 B.

See also Railway Engineering, Permanent Way.

## Tunneling.

A New Method of Rock Tunneling Under City Streets. Frank Richards. Illustrates and describes the method of driving rock tunnel heading with drills and "Radialaxe" channelers. 1800 w. Eng News—April 5, 1906. No. 75948.

The New Bergen Hill Tunnel of the Lackawanna. J. H. Philips. Detailed description, with diagrams, of this new tunnel to relieve congestion at this point on the Lackawanna R. R. 1000 w. R R Gaz—April 6, 1906. No. 75954.

## Underpinning.

Transferring a 2,000-Ton Wall to Columns and Girders. Illustrated description of a method of underpinning used for a heavy wall. 1200 w. Eng Rec—Nov. 4, 1905. No. 73064.

Underpinning Old Walls with Steel Columns. Illustrates and describes the method of underpinning an old brick wall with double pipe columns in the course of erecting a tall office building in New York City. 1400 w. Eng Rec—March 31, 1906. No. 75886.

Underpinning the Marshall Field Building in Chicago. An interesting illustrated description of method of shoring a building while heavy foundations were constructed under it, and under very difficult conditions. 4000 w. Eng Rec—May 5, 1906. No. 76520.

Underpinning the Criterion Hotel, New York. The reconstruction of this building to adapt it for commercial uses, made necessary some interesting underpinning and heavy shoring, which is illustrated and described. 1200 w. Eng Rec—June 2, 1906. No. 77077.

Underpinning a Tall Brewery Wall on Rock Foundations. A brewery on Park Ave., New York City, jeopardized by the terminal improvements of the N. Y. C. & H. R. R. R., is described and the method of underpinning explained and illustrated. 1800 w. Eng Rec—July 7, 1906. No. 77839.

Underpinning the Grand Central Palace, New York. Illustrated description of methods used in underpinning a heavy wall of old-fashioned construction in

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### Asphalt

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### Brick

connection with the construction work of the depressed yards of the N. Y. C. & H. R. R. R. Also editorial. 2800 w. Eng Rec—June 30, 1906. No. 77723.

### Waterproofing.

Waterproofing Concrete on U. S. Fortification Work. Emile Low. Abstracts from Technical Details of Engineering Methods on Fortifications, Rivers and

Harbors, and other works. 2500 w. Eng News—Sept. 6, 1906. No. 79096.

### Waterproofing Concrete.

Experiences in Water-Proofing Concrete, U. S. Fortification Work. Abstract from Annual Report from 1905 of the Chief of Engineers describing methods used. Ills. 1600 w. Eng News—March 15, 1906. No. 75532.

## MATERIALS OF CONSTRUCTION

### Asphalt.

The Uses of Natural Asphalt in the Arts. Felix Lindenberg. A brief review of past uses, with a description of some of the more important present uses of natural asphalt. 5000 w. Sci Am Sup—May 5, 1906. No. 76502.

The Proximate Composition and Physical Structure of Trinidad Asphalt. Clifford Richardson. Reports investigations carried out to determine the character of the substances which make up the portion of refined asphalt hitherto regarded as "organic matter not bitumen." 3500 w. Eng Rec—June 30, 1906. No. 77727.

Some Further Notes on Asphalt. An account of recent developments in the knowledge of asphaltic substances, intended to be supplementary to an earlier series of articles on this subject. 4000 w. Builder—Aug. 18, 1906. Serial. 1st part. No. 78836 A.

### Bitumen.

The Bitumen Springs of Antiquity. Edgar James Banks. An interesting account of the bitumen springs on the Euphrates, and the uses made of the material. 1200 w. Eng News—Sept. 6, 1906. No. 79094.

The Relation Between Some Physical Properties of Bitumens and Oils. A. W. Dow. Read before the Am. Soc. for Test. Mat. Gives results of tests and investigations on asphalts and like bitumens, discussing the possible physical conditions that give the different properties. 2700 w. Eng Rec—Aug. 8, 1906. No. 78641.

### Brick.

The Manufacture of Brick from Shale. Illustrated detailed description of a plant at Galesburg, Ill. 2700 w. Eng. Rec—March 17, 1906. No. 75573.

A Large Shale Brick Factory in Eastern Illinois. Illustrates and describes a plant at Danville, Ill., which has a capacity of producing 200,000 bricks a day. 3000 w. Eng Rec—July 7, 1906. No. 77838.

Sand-Lime Brick. E. W. Lazell. Considers the materials, methods of manufacture, and the uses, reporting the results of tests. 2500 w. Pro Engrs' club of Phila.—Jan, 1906. No. 74532 D.

Tests of the Strength and Fireproof Qualities of Sand-Lime Brick. Ira H. Woolson. Reports a full series of tests made upon 15 varieties of common clay bricks, and a description of the tests applied to sand-lime bricks with the results. 5000 w. Eng News—June 14, 1906. No. 77440.

The Strength of Brickwork. Editorial review of the Report on Brickwork Tests, conducted by a committee of the Royal Institute of British Architects. 2500 w. Engng—June 15, 1906. No. 77487 A.

New Sand-Lime Brick Plant at South River, N. J. A plant for the manufacture of sand-lime brick under the Huenekes system is illustrated and described. 2700 w. Eng Rec—July 14, 1906. No. 77938.

Sand-Lime Brick. Frances Densmore. Describes the manufacture of sand-lime bricks and the tests they have satisfactorily undergone. 1800 w. Sci Am Sup—Aug. 25, 1906. No. 78699.

The Strength Properties of Brickwork as Determined by Experiment. W. C. Popplewell. Read before the British Assn. of San. Engrs. A report of tests made and their results. 2800 w. Munic Engng—Oct., 1906. No. 79734 C.

The Manufacture of Silico-Calcareous Bricks (Fabrication des Briques Silico-Calcaires). A description of the Röhrig and König process, with plan of works for the manufacture. The bricks have a high crushing strength and resistance to fire. 1200 w. 1 plate. Génie Civil—Jan. 27, 1906. No. 75113 D.

Brick and Tile Making in the Tropics. C. C. Fuller. Illustrates and describes the methods used in South Africa. 1500 w. Sci Am—Sept. 1, 1906. No. 78905.

# CIVIL ENGINEERING

## Building Stone

The Rattling Test as a Safe Method of Disclosing the Permissible Absorption of Paving Brick. Prof. Edward Orton, Jr. Read before the Nat. Brick Mfrs.' Assn. The present number discusses the standing of the rattling, absorption and other tests, reports investigations made, and tests carried out. 3800 w. Brick—June, 1906. Serial. 1st part. No. 77162.

## Building Stone.

The Microscopic Structure of Building Stones. Henry Leffmann. Discusses the rocks and rock-substitutes used in engineering construction, and the relation between laboratory observation and practical application, indicating results that have been obtained. Also general discussion. 7000 w. Pro Engrs' Club of Phila—Oct., 1905. No. 73936 D.

The Effect of Fire on Building Stones. W. R. Baldwin-Wiseman. Begins a report of research work to determine the effect of a severe conflagration, and to afford assistance to those who must decide whether demolition or reconstruction shall succeed a conflagration. 3000 w. Quarry—Aug., 1906. Serial. 1st part. No. 78543 A.

Tests of Building Stones. Valuable data on the fire resistance of natural building stones found in New York State. Ills. 3300 w. Ins Engng—July, 1906. No. 78245 C.

## Building Materials.

Building Materials in the San Francisco Earthquake. Information taken from a series of articles by Wm. Ham. Hall for the *San Francisco Chronicle*, in regard to the reasons for the great differences in the effects of the earthquake upon buildings and streets. 3500 w. Munic Engng—Sept., 1906. No. 79269 C.

## Cement.

A Comparison of the Recent British and American Specifications for Cement. R. W. Lesley. Abstract of a paper read before the Am. Soc. for Test. Materials. 1300 w. Eng News—Nov. 16, 1905. No. 73223.

Experiments on the Manufacture of White Portland Cement. Charles Delavan Quick. Discusses the commercial practicability of producing a pure white Portland cement. 1800 w. Eng News—Dec. 28, 1905. No. 74033.

Portland Cement Materials. O. H. Howarth. Considers the importance of thorough mixing; the presence of iron; and the sources of materials in the United States. 4800 w. Mines & Min—Dec., 1905. No. 73716 C.

The First Attempt to Manufacture Nat-

## MATERIALS OF CONSTRUCTION

## Cement

ural Cement in the United States. Edwin C. Eckel. Gives a letter describing an attempt to manufacture this product, made by a Mr. Randolph, of Virginia, in 1817. 1000 w. Eng News—Dec. 7, 1905. No. 73630.

Cement Production and Manufacture in the United States. Edwin S. Eckel. A detailed study of the cement industry in the United States; showing its rapid growth in recent years. 3000 w. Engineering Magazine—Feb. 1906. No. 74675 B.

## Cement.

A Large Portland Cement Plant at Bath, Pa. W. G. Tatnall. Illustrated detailed description of a plant designed for 2500 barrels output per day. 3000 w. Engr, U S A—Feb. 1, 1906. No. 74859 C.

Cement and Building Construction. C. A. P. Turner. Read at Con. of Nat. Cement Users. Discusses the importance of good workmanship in the use of this material, giving points that should secure good results. 2800 w. Munic Engng—Feb., 1906. No. 75215 C.

Flame Regulation in Cement Burning. Carleton Ellis. Discusses methods of cement burning and the causes of imperfect calcination. 2000 w. Cement Age—Feb., 1906. No. 75213.

The Testing and Use of Portland and Natural Cements. E. S. Larned. Read before the Nat. Assn. of Cement Users. Gives an expert's views, with details and results of experiments. 4300 w. Munic Jour & Engr—Feb. 7, 1906. No. 75006.

The Use of Cement for Farm Purposes. S. M. Woodward. Read at Con. of Nat. Assn. of Cement Users. Suggests some uses to which cement is applicable. 2000 w. Munic Engng—Feb., 1906. No. 75216 C.

Cement. Robert W. Lesley. A review of the cement industry for the year, the enormous growth of the production in the United States, the distribution, market, etc. 2500 w. Eng & Min Jour—Jan. 6, 1906. No. 74268.

Report of the Committee of the National Fire Protection Association on Cement for Building Construction. Remarks on the material, with report of tests made and the results. 3500 w. Cement—Jan. 1906. No. 74190 C.

The Development in the Uses of Cement. Richard L. Humphrey. Presidential address before the Nat. Assoc. of Cement Users. Historical review. 2500 w. Eng. Rec—Jan. 27, 1906. No. 74766.

Cement Burning. W. H. Hess. Discusses the relation of volume weight of raw cement material to the output of a

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Cement

## MATERIALS OF CONSTRUCTION

Cement

rotary kiln. 1500 w. Cement Age—March, 1906. No. 75466.

Cement, Mortar and Concrete. Their Preparation and Use for Farm Purposes. Philip L. Wormley, Jr. Reprint from Bul. No. 235, issued by the Dept. of Agriculture. Describes a proper method of mixing concrete, and some points in construction which are of particular interest to farmers. 3500 w. Sci Am Sup—March 10, 1906. Serial, 1st part. No. 75433.

Manufacture of Hydraulic Cements. L. L. Stone. Read before the Univ. of Michigan Engng. Soc. A description of the processes of manufacture. 3000 w. Sci Am Sup—March 10, 1906. No. 75432.

Report of a Test on a Portland Cement Plant. E. C. Soper, Jr. Briefly refers to the history, growth and extent of this industry, describing a typical plant, comparing processes, and reporting tests. Discussion. 7500 w. Jour W Soc of Engrs—Feb., 1906. No. 75418 D.

The Clinkering Curves of Portland Cement. Fred Vickery. Describes investigations made and gives results obtained. 1800 w. Cal Jour of Tech—Feb., 1906. No. 75959 C.

The New Kiln Firing Process at the Lawrence Cement Co.'s Siegfried Mill. Information concerning the new method introduced in this mill in Siegfried, Pa. Ills. 1000 w. Eng Rec—April 7, 1906. No. 75986.

A New Magnesium Oxy-Chloride Cementing Material. Thomas W. Capposi. Information concerning this material and its uses. 1100 w. Eng News—May 17, 1906. No. 76676.

British Standard Specification for Cement. The comments of an English engineer on the work and report of the committee which drew up the British Standard Specification for cement. 1000 w. Cement Age—May, 1906. No. 76518.

Problems in Burning Portland Cement with Long Rotary Kilns. Carleton Ellis. A discussion of the "long" kiln and its economies, with remarks on the Eldred system. Ills. 1000 w. Eng News—May 24, 1906. No. 76781.

A New Fine Grinding Machine for Cement Mills. Richard K. Meade. Illustrates and describes a new mill which is giving good results. 2200 w. Eng News—June 21, 1906. No. 77411.

Cement for Building Construction. Report of a special committee of the National Fire Protection Association. Concrete blocks, reinforced concrete, and reinforced concrete beams are considered.

4000 w. Eng Rec—June 9, 1906. No. 77239.

Cement Materials and Industry of the United States. Edwin C. Eckel. Abstract from Bul. U. S. Geol. Survey. Defines the classes of hydraulic cements, discussing the materials and manufacture. 5700 w. Sci Am Sup—June 2, 1906. No. 77047.

Cement on the Farm. E. A. Trego. Remarks on the adaptability of the material to farm needs, describing a model farm on Long Island. 1600 w. Cement Age—June, 1906. No. 77122.

The Decomposition of Cements in Sea Water. H. Le Chatelier. From the Pro. of the Int. Assn. of Test. Mat. A sketch of laboratory experiments made by the writer. 2000 w. Munic Engng—June, 1906. No. 77305 C.

The Formation of Rings in Cement Kilns. Carleton Ellis. Brief discussion of the causes of these aggregations which frequently encrust the internal walls of a rotary cement kiln and prevent the free passage of flames and gases. 1200 w. Eng Rec—June 16, 1906. No. 77343.

A Talk on Cement. An article based on an account by P. Gillespie, in the report of the Bureau of Mines of Ontario, Vol XIV. Its chemical composition and uses are discussed in the present number. 1200 w. Can Archt—June, 1906. Serial. 1st part. No. 77714 C.

Cement Testing Laboratory, Philadelphia Rapid Transit Company. Gives the specifications for Portland cement as adopted, and describes the tests, and other work done in the laboratory. 2200 w. Ry Age—July 27, 1906. No. 78290.

The Manufacture of Portland Cement. On the processes of cement-making as carried on at the Northfleet Works of the Associated Portland Cement-Manufacturers, Limited. Ills. 4000 w. Engng—July 20, 1906. No. 78308 A.

Further Tests of the Effect of Oil on the Strength of Portland Cement Briquettes. Gives a report of tests showing the comparative strength of Portland cement briquettes, both neat and of a 3 to 1 mixture, when immersed in water and in oil. 600 w. Eng News—Aug. 30, 1906. No. 78898.

Machinery and Processes in a Modern Portland-Cement Plant. F. H. Lewis. The first article discusses the development of modern cement-burning methods, showing the pursuit of economy in kiln practice, with numerous illustrations. 3000 w. Engineering Magazine—September, 1906. No. 78775 B.

# CIVIL ENGINEERING

## Cement Blocks

## MATERIALS OF CONSTRUCTION

## Concrete

Methods for Testing Cements for Waterproofing Properties. W. Purves Taylor. Deals especially with the methods where compounds are added to the cement or concrete in mixing and hence forming a part of the concrete. 1500 w. Cement Age—Aug., 1906. No. 78605.

The Determination of the Specific Gravity of Cements. Richard K. Meade. Read before the Am. Soc. of Test. Mat. Gives results of investigations made to determine the reliability of the various forms of apparatus now in common use for taking the specific gravity of cements. 1600 w. Cement Age—Aug., 1906. No. 78606.

Machinery and Processes for a Portland-Cement Plant. F. H. Lewis. The second paper treats of the machinery and processes for grinding by separation, with numerous illustrations of plants and apparatus. 3000 w. Engineering Magazine—Nov., 1906. No. 79995 B.

Recent Progress in the Cement, Lime, Phosphate, and Soda Industry (Neuere Fortschritte in der Zement, Kalk, Phosphat, und Kali industrie). C. Naske. Discussing especially modern grinding and mixing machinery as applied to the manufacture of cement and allied industries. Two articles. 5000 w. Zeitschr d Ver Deutscher Ing—Sept. 29, Oct. 13, 1906. No. 79904, each D.

Some Experiments on the Permeability of Cement-Mortars to Water Under Pressure. Joseph W. Ellms. A report of a series of experiments made by the writer, with a study of the results. 2000 w. Eng Rec—Oct. 27, 1906. No. 80112.

Notes on Compression Tests of Cement. W. Purves Taylor. Read before the Am. Soc. of Test Mat. A report of tests carried out in the Philadelphia laboratories. 1200 w. Cement Age—Sept., 1906. No. 79258.

## Cement Blocks.

Cement Block Manufacture. S. B. Newberry. From a paper before the Nat. Assn. of Cement Users. Considers the two systems of block making, block machines, their hardening and storage, cost, etc. 2000 w. Munic Engng—June, 1906. No. 77302 C.

Cement Block Architecture. Louis H. Gibson. Discusses this material and its defects and possibilities. 3000 w. Cement—July, 1906. No. 78364 C.

## Cement Burning.

The Gas Producer in the Manufacture of Cement (Der Generator in der Zement-industrie). C. Naske. A discussion of

the heat balance in the cement kiln, with especial reference to gas firing. 2500 w. Zeitschr d Ver Deutscher Ing—April 7, 1906. No. 76206 D.

## Cement Mortar.

Comparative Tests of Cement Mortar, Showing the Relative Effects of Three Different Sands. A. Black. Gives results of comparative tests planned to show the relative effects of three different sand materials on the strength of Portland cement mortar. 600 w. Eng News—Aug. 30, 1906. No. 78901.

## Clay.

The Use of Burned Clay Products in the Fireproofing of Buildings. Peter B. Wight. Read before the Int. Cong. of Archts., London. Treats of the actual use of burned clay in building construction as employed in the United States in the erection of fireproof buildings. 3000 w. Am Archt—Sept. 1, 1906. Serial. 1st part. No. 78909.

Burnt Clay as the Universal Building Material. F. W. Fitzpatrick. Historical review of the use of this material, urging its value as a fireproof material. Ills. 4000 w. Brick—May, 1906. No. 76585.

## Compression.

Some Experiments for Determining the Elastic and Ultimate Strength of Brickwork Piers and Pillars of Portland-Cement Concrete. William Charles Poplewell. Describes tests carried out and gives conclusions. 3800 w. (No. 3549.) Inst of Civ Engrs—No. 73169 N. Nov. 9, 1905. No. 73080.

The Compressive Resistance of Blocks and Columns of Concrete and Stone. Describes tests made which show the importance of considering the lateral and tensile stresses as well as the compressive force. Ills. 2400 w. Cement—Nov., 1905. No. 73109 C.

## Concrete.

German Specifications for Designing, Constructing and Testing Concrete Structures. Leon S. Moisseiff. Gives the full set of specifications recommended for adoption by a committee of the German Concrete Society. 4500 w. Eng News—

Some Remarkable Tests Indicating "Flow" of Concrete Under Pressure. Ira H. Woolson. Illustrated account of some rather extraordinary results obtained in the Columbia Univ. Test. Laboratory. 600 w. Eng News—Nov. 2, 1905. No. 72958.

Concrete Aggregates. Sanford E. Thompson. Read before the Nat. Assn. of Cement Users. Enumerates the general principles which should be followed in the selection of sand and stone for mortar

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## Concrete

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## Concrete Blocks

and concrete, and describes the method of testing aggregates and determining proportions. 3500 w. Eng Rec—Jan. 27, 1906. No. 74773.

**Concrete Aggregates.** Sanford E. Thompson. Gives the general principles that should be followed in the selection of sand and stone for mortar and concrete, and describes the method of testing aggregates and determining proportions. 4000 w. Cement—May, 1906. No. 77034 C.

**The Action of Sea-Water upon Concrete.** J. Watt Sandeman. Gives a record of results based on actual tests, and long experience in the construction of dock and pier works in concrete, concerning the standard proportions for concretes which enable them to permanently resist the action of sea-water. 1200 w. Engng—Jan. 5, 1906. No. 74414 A.

**Concrete Mixing Machinery.** Illustrates and describes a number of interesting concrete mixers of various types. 2500 w. Sci Am—May 12, 1906. No. 76629.

**Concrete Mixing Machinery.** William L. Larkin. General discussion of machinery for concrete mixing, the defects of the earlier machines, and the types in use at present, and the method of operating. 5000 w. Sci Am Sup—May 26, 1906. No. 76791.

**Determining Quantities in Concrete Mixing.** Sanford E. Thompson. Presents an average and uniform method for proportioning materials for Portland cement concrete. 900 w. Cement Age—May, 1906. No. 76519.

**Concrete Work in Boston.** E. S. Larned. Descriptions of some of the buildings and structures which have recently been completed or are being built. Ills. 5000 w. Cement Age—June, 1906. No. 77121.

**Investigation of the Thermal Conductivity of Concrete and the Effect of Heat Upon Its Strength and Elastic Properties.** Ira H. Woolson. Read before the Am. Soc. of Test Materials. A record of experiments on the conductivity, strength and elasticity of concrete. 3000 w. Eng News—June 28, 1906. No. 77533.

**Some Examples of Concrete Mixing and Delivery Plant.** William G. Fargo. Abstract of a paper read before the Mich. Engng. Soc. Illustrates and describes several types of concrete plant suitable for moderately heavy work, treating more especially the handling to and from the mixer. 2500 w. Eng News—May 31, 1906. No. 77041.

**The Comparative Resistance to Fire of Stone Concrete and Cinder Concrete.**

Describes two tests made by the British Fire Prevention Committee demonstrating the superiority of cinder concrete. 1200 w. Eng News—May 31, 1906. No. 77039.

**The Early Use of Concrete.** Extracts from a paper by Thomas Potter in *The Builders' Jour.* Reviews some very early uses of this material. 3500 w. Am Archt—June 23, 1906. No. 77424.

**Proportioning Concrete.** Sanford E. Thompson. Considers methods of proportioning materials and for comparisons of quality, and the effect of different characters of aggregate. General discussion. 5800 w. Jour Assn of Engng Socs—April, 1906. No. 78239 C.

**The Action of Sea Water Upon Concrete.** J. Watt Sandeman. Discusses proposed standard proportions for impervious concrete, giving tables estimating cost, etc. 1400 w. Sci Am Sup—June 30, 1906. No. 77711.

**The Puddling Effect of Water Flowing Through Concrete.** William Ralph Baldwin-Wiseman. Gives results of experiments on the rate of flow of water through a specimen of concrete, identical in composition with that used in the construction of the new graving-rock at Southampton. 1200 w. Inst of Civ Engrs—No. 3574. No. 78022 N.

**Concrete as a Building Material.** William L. Price. A review of the possibilities of concrete construction from the standpoint of utility and art. 1500 w. Cement Age—Aug., 1906. No. 78607.

## Concrete Blocks.

**Concrete Block Construction and the Architects.** Editorial discussion of this material, the shortcomings of the block maker, and the neglect of the architect. 1700 w. Eng News—Nov. 23, 1905. No. 73425.

**The Manufacture of Concrete Blocks and Their Use in Building Construction.** H. G. Richey. Third prize paper. Considers points of importance in the manufacture and construction. Ills. 7000 w. Cement Age—Nov., 1905. No. 73266.

**Principles of success in Concrete Block Manufacture.** Louis H. Gibson. Discusses some of the reasons why this material is not more popular with architects and the public. Ills. 3000 w. Munic Engng—Jan. 1906. No. 74187 C.

**The Manufacture of Concrete Blocks and Their Use in Building Construction.** W. G. Hayne. Fifth prize paper. Discusses the location and design of the plant, its equipment, the materials used, methods,



# CIVIL ENGINEERING

## Corrosion

etc. 6500 w. Cement Age—Jan., 1906. No. 74315.

The Ideal Concrete Block made Practical. Louis H. Gibson. Outlines the factors to be aimed at in the making of concrete blocks, discussing the principles and suggesting methods. 2800 w. Munic Engng. March, 1906. No. 75339 C.

Cement Block Architecture. Louis H. Gibson. Gives illustrations of successful work with this material, discussing them and the material used. 2500 w. Munic Engng—May, 1906. No. 76909 C.

Concrete Block Machines. Illustrates and describes types, with remarks on the material and its advantages in fireproof construction. 1800 w. Sci Am—May, 1906. No. 76630.

## Corrosion.

Protection of Structural Work from Rust. Robert Job. Reports experiments showing that the greater the degree of fineness of the pigment, the greater durability of the service. 900 w. Am Mfr—Jan. 11, 1906. No. 74341.

The Action of Slightly Alkaline Waters on Iron. Cecil H. Cribb and F. W. F. Arnaud. Abstract of a paper read before the Soc. of Pub. Analysts. Shows that an action occurs, often equal to that which takes place in the absence of an alkali. 1200 w. Engng—Jan. 5, 1906. No. 74422 A.

The Corrosion of Fence Wire. Report of an investigation by the Department of Agriculture. 3000 w. Ir Age—Jan. 11, 1906. No. 74305.

The Preservation of Iron and Steel. B. H. Thwaite. Considers the effects of corrosion and discusses methods of preservation. 2000 w. Ir & St Mag—May, 1906. No. 76900 D.

## Dynamite.

Proper Methods for Thawing Dynamite. Information from a brochure printed by the DuPont Co., Wilmington, Del. 1100 w. Eng & Min Jour—May 12, 1906. No. 76606.

## Explosives.

The Chemical Analysis of Dynamites. Graduation thesis by J. P. Benbrook, Jr., and J. H. Fulton. Introductory notes explaining the composition of modern explosives, especially dynamites, giving two methods of analysis. 2700 w. Stevens Ind—Oct., 1905. No. 73930 D.

The Testing of Explosives Used in Engineering. J. B. Porter. Illustrates and describes apparatus and methods used discussing especially closed explosion chambers, crusher gauges, and devices for miniature blasts, reporting recent tests. Ills.

## MATERIALS OF CONSTRUCTION

## Marble

2400 w. Can Soc of Civ Engrs—Nov. 30, 1905. (Ad. proof.) No. 74092 C.

## Fire Brick.

Fire-Brick Work. R. P. King. Considers important points in the building of fire-resisting structures, particularly in reference to boiler setting. 2000 w. Am Mach—Vol. 29, No. 15. No. 76034.

## Fire Tests.

Fire Tests with Concrete and Reinforced Concrete. An account of the fire and water tests conducted by the British Fire-Prevention Committee. 1800 w. Engng—Nov. 17, 1905. No. 73482 A.

## Gypsum.

Gypsum—A Much Misunderstood Material. Robert Grimshaw. Information of interest concerning gypsum and its use. 1800 w. Sci Am Sup—June 23, 1906. No. 77422.

Gypsum Plants, or the Manufacture of Plaster of Paris, or Stucco. C. O. Bartlett. Describes the machinery used in the manufacture of plaster-of-Paris. 700 w. Min Rept—Sept. 20, 1906. No. 79420.

Industrial Applications of Gypsum. Robert Grimshaw. The use of gypsum for casts and the methods of molding are discussed in the present article, also its use as a cement, and in interior decorations and construction. 2700 w. Sci Am Sup—Sept. 29, 1906. Serial. 1st part. No. 79504.

## Laboratory.

The Underwriters' Laboratory Plant in Chicago. Illustrated detailed description of this building which is devoted exclusively to experimental work in fire protection engineering. 2700 w. Eng Rec—July 7, 1906. No. 77833.

## Lime.

The Rapid Volumetric Determination of Lime. Richard K. Meade. Outlines a rapid method applicable to materials in which the lime is present as either oxide, carbonate or silicate. 1000 w. Am Mfr—Jan. 11, 1906. No. 74342.

## Marble.

Marble Cutting for the New York Public Library Building. Describes the shop and equipment where this work is carried on. 2000 w. Eng Rec—March 3, 1906. No. 75389.

Marble Working in the Apuan Alps (Italy). Sig. Ernesto Oreglia. Abstracted from *Rassegna Mineraria*. Illustrates and describes the sawing of marble into blocks and the machines used, with other methods and appliances. 4200 w. Quarry—March, 1906. No. 75492 A.

# CIVIL ENGINEERING

## Piles

Marble in the Northwest. J. C. Rathbun. Introductory remarks on varieties of marble and the qualities that determine their value. Information concerning the deposits in the northwest, especially in Washington and Alaska. 2000 w. Min Wld—April 7, 1906. No. 75979.

## Piles.

Recent Improvements in Piles. An illustrated article showing what is being done by means of concrete, and steel and concrete, to supersede the old wooden piles. 2200 w. Engr, Lond—Jan. 19, 1906. Serial. 1st part. No. 74753 A.

The Manufacture and Use of Concrete Piles. Henry Longcope. Reviews the various methods tried for substituting other material for wooden piles, and the systems for forming concrete piles, and the success attained. 2500 w. Cement—May, 1906. No. 77035 C.

New Concrete Covering for Timber Piles in Teredo-Infested Waters. Briefly refers to the forms of protection used, and the objections to them, and gives an illustrated description of a lock-joint concrete pipe armoring. 600 w. Eng News—Jan. 4, 1906. No. 74177.

Protecting Piles from the Teredo. Illustrates and describes the pipe protection being used, explaining the destruction caused by the teredo, and the methods tried to prevent it. 1200 w. R R Gaz—Aug. 17, 1906. No. 78618.

Reinforced Concrete Casing for the Protection of Piles in Wharf Construction. F. A. Koetitz. Illustrated description of a system designed by the writer, either to encase wooden piles or to replace them. 1500 w. Jour Assn of Engng Socs—May, 1906. No. 7886 C.

## Pipes.

The Testing of Clay and Concrete Pipes. H. Burchartz. Illustrates and describes the methods of testing for ascertaining the various properties required, and gives much information relating to these materials. 4500 w. Eng Rec—Aug. 18, 1906. No. 78643.

## Plaster.

Plaster Mining and Preparation in the Vicinity of Paris. Jacques Boyer. A fully illustrated account of the quarrying of the gypsum, and the practical operations of calcining and grinding plaster as conducted near Paris. 2500 w. Engineering Magazine—March, 1906. No. 75164 B.

Lime vs. Gypsum Plaster. R. S. Edwards. First prize paper. Aims to show the advantages in the use of large quantities of lime, and the ill effect caused by too large percentages of gypsum plaster. 3500 w. Cement—Jan, 1906. No. 74192 C.

## MATERIALS OF CONSTRUCTION

## Reinforced Concrete

I. Plaster-Work. George P. Bankart.  
II. Decorative Plaster Ceilings. Laurence A. Turner. Two papers discussed together. Traces the development of ornamentation in plaster work in the first paper; and deals with the materials used and execution of the work in the second. Ills. 9300 w. Jour Roy Inst of Brit Archts—April 28, 1906. No. 76713 B.

## Protective Coatings.

Protective Coatings for Iron and Steel. Arthur B. Harrison. Read before the Am. Soc. for Test. Mat. Reviews the opinions of those who have made a study of this subject, and reports experiments and results. Favors the use of carbon coatings which dry by evaporation. 3000 w. Eng Rec—July 7, 1906. No. 77835.

## Protective Paints.

Methods of Testing the Protective Power of Paints Used on Metallic Structures. Remarks on rust and the preparations for protecting iron, showing that the durability of a preparation depends on the quality of the linseed oil employed. 700 w. Am Mach—Vol. 29. No. 25. No. 77408.

## Reinforced Concrete.

Breaking Tests of Reinforced Concrete Structures. Illustrated report of tests made of various structures at the exhibition of the German Municipalities at Dresden, at the time of their removal. 3000 w. Cement—Nov., 1905. No. 73108 C.

Reinforced Concrete Applied to Modern Shop Construction. E. N. Hunting. States the advantages of this material, showing how well it is adapted to shop construction; also gives some data on actual work of this class. Ills. 1800 w. Trans Am Soc of Mech Engrs (No. 083)—Dec., 1905. No. 73439 C.

The Bursting Strength of Reinforced Concrete Pipes. Describes experiments made by the engineers of the U. S. Reclamation Service with great care, which indicated that such a system of construction is not satisfactory for pipes under considerable heads. Also editorial. 5500 w. Eng Rec—Dec. 9, 1905. No. 73675.

The Fire-Resisting Qualities of Reinforced Concrete. Capt. John Stephen Sewell. An engineer's views on the requirements of fireproof construction and the adaptability of reinforced concrete. Ills. 4000 w. Ins Engng—Dec., 1905. No. 74067 C.

A new method of Calculating the Proportions of Reinforced-Concrete Structures (Nouvelle Méthode de Calcul des Ouvrages en Béton Armé). Col. G. Esptallier. Describing methods and results of tests showing measurements of the

# CIVIL ENGINEERING

## Rigidity

actual elasticity of the metal and concrete, with computations based thereon. 2500 w. *Génie Civil*—Jan. 6, 1906. No. 74634 D.

Armored Concrete. Henry J. Jones, in *Technics*. Discusses the economy of this material and its value, the systems and methods, giving information concerning its use. Ills. 2200 w. *Sci Am Sup*—Jan. 13, 1906. Serial. 1st part. No. 74389.

Bending Tests on Reinforced Concrete Beams (Biegungsversuche mit Armierten Betonbalken) E. Mörsch. Giving diagrams of deflections and extensions, showing the relative action of the concrete and metal. 2000 w. *Schweiz Bauzeitung*—Dec. 16, 1905. No. 74665 B.

Forms of Concrete Reinforcement. Illustrated discussion of the forms of metal most widely used for reinforcement. 4300 w. *Ir Age*—Jan. 11, 1906. No. 74304.

Shear and Adhesion in Reinforced Concrete. Editorial discussion of this material, its uses and limitations; suggesting lines along which experimental investigation is still needed, and giving conclusions arrived at from recent tests by J. J. Harding, and remarks on the lessons taught by them. 3000 w. *Engng*—Jan. 5, 1906. No. 74420 A.

Some Further Tests of Reinforced-Concrete Beams, C. M. & St. P. Ry. J. J. Harding. Describes tests made by the Bridge & Building Dept. of the road named with a study of the results and statement of conclusions. General discussion. Ills. 10500 w. *Jour W Soc of Engrs*—Dec. 1905. No. 74554 D.

See Civil Engineering, Construction.

## Rigidity.

The Rigidity of Constructive Materials. James E. Howard. Gives diagram showing the moduli of elasticity of different engineering materials, with notes. 1200 w. *Eng Rec*—May 26, 1906. No. 76960.

## Rock.

The Rationale of Rock Crushing. O. H. Howarth. Explains the conditions under which a rock breaks when crushed by a stamp, crusher, or rolls. 4500 w. *Mines & Min*—May, 1906. No. 76510 C.

## Shearing.

Shearing Forces Due to a Uniform Advancing Load on Beams and Braced Girders. Prof. W. E. Lilly. A solution of the maximum shearing stresses in the bracing of girders under a uniform advancing load equal in length to the span. 500 w. *Engng*—Nov. 10, 1905. No. 73286 A.

## Sheet Piling.

American Steel Sheet Piling. Illustrated descriptions of a number of de-

## MATERIALS OF CONSTRUCTION

## Stucco

signs used for cofferdams, mine shafts, wells for foundation piers, and general foundation work. 1100 w. *Engr, Lond*—Nov. 3, 1905. No. 73136 A.

Steel Sheet Piling. Describes recent work where this material has been used. 1700 w. *Eng News*—Nov. 23, 1905. No. 73423.

## Slag.

Slag Granulating and Conveying Device. Hiram W. Hixon. Drawing and description of a device which has been in use five years. 700 w. *Eng & Min Jour*—Sept. 22, 1906. No. 79414.

## Steelwork.

Structural Steelwork. W. S. Smart. Abstract of a paper before the Midland Jun. Gas Engng. Assn. Discusses the materials, girders, roofs and roof-covering, columns, &c. 3500 w. *Ir & Coal Trds Rev*—Dec. 1, 1905. No. 73687 A.

## Stone.

Note on the Resistance of Building Stones to Frost. Prof. J. Malette. Brief description of methods of testing building stones, with illustrations of blocks treated. 1000 w. *Builder*—Sept. 15, 1906. No. 79438 A.

Manufactured Stone. Charles D. Watson. A review of the progress of cement work in Canada, with an estimate of the value of manufactured stone in its relation to reinforced concrete construction. Ills. 2800 w. *Cement Age*—May, 1906. No. 76516.

Specifications for Stone. Francis W. Hoyt. Discusses points in regard to the choice of stone for buildings, the life of various kinds of stone, etc. 3500 w. *Am Archt*—Aug. 18, 1906. No. 78615.

## Stone Crushing.

A Large Stone Crushing Plant at Gary, Ill. Illustrates and describes the plant and its interesting machinery equipment. 800 w. *Eng News*—Oct. 11, 1906. No. 79716.

## Structural Steel.

The Deterioration of Structural Steel by Corrosion and Electrolysis. Selection from a paper read by James B. Cook, before the Memphis Engineering Society. Discusses the action of rust and its results, electrolysis and its action, and the danger of stray currents on iron and steel skeleton construction. Ills. 3000 w. *Archts & Build's Mag*—Oct., 1906. No. 79737 C.

## Stucco.

The Manufacture of Plaster of Paris or Stucco. C. O. Bartlett. Describes the method of manufacture, and gives the

# CIVIL ENGINEERING

## Tension

machinery required. 600 w. Min Rept—March 1, 1906. No. 75349.

## Tension.

Some Tests Bearing on the Design of Tension Members. Edward Godfrey. States a clause in specifications for steel-work and reports tests made of the principle implied, discussing some other things brought out by the investigation. 2200 w. Eng News—May 3, 1906. No. 76473.

## Terra Cotta.

New Uses for Terra Cotta Building Blocks. An illustrated description of various types of blocks and their uses. 2000 w. Br Build—Aug., 1906. No. 79150 D.

## Testing.

Some Experiments on the strength of Brickwork Piers and Pillars of Concrete. William Charles Popplewell. Describes experiments carried out in the vertical 750-ton compression testing-machine, at the Municipal School of Technology, Manchester. 4000 w. Eng News—Jan. 4, 1906. No. 74171.

Influence of the Temperature of Water upon Test Pieces (Influence de la Temperature de l'Eau sur les Eprouvettes). M. Mercier. Data and results of investigations upon the influence of the temperature of the water on cement and mortar briquettes. 2500 w. Ann d Ponts et Chaussées—I Trimestre, 1906. No. 78132 E & F.

Tension-Tests of Steel Angles with Various Types of End-Connection. Frank P. McKibben. Read before the Am. Soc. for Test. Mat. An account of tests made in the testing laboratory of the Mass. Inst. of Technology upon 27 specimens of rolled steel angles such as are used in structural work. 1200 w. Eng News—July 5, 1906. No. 77820.

The Sand Blast for Testing Materials. H. Burchartz. Illustrates and describes the apparatus used in applying the sand blast to the testing of materials for building, paving, etc. 1200 w. Eng Rec—July 14, 1906. No. 77936.

## Timber.

The Inspection of Treatment for the Protection of Timber by the Injection of Creosote Oil. H. R. Stanford. Treats only of the quantity of oil which is injected, and is based on tests and observations made upon yellow pine treated for use in engineering structures in Pensacola Bay. 2500 w. Pro Am Soc of Civ Engrs—Nov., 1905. No. 73437 E.

Experience in Creosoting Douglas Fir.

## MATERIALS OF CONSTRUCTION

## Timber Treatment

P. F. Dundon. Extract from a paper read before the Wood Preservers' Assn. Gives the writer's experience with "Oregon pine," and timbers of the Pacific Coast. 600 w. Eng News—Feb. 8, 1906. No. 74917.

Recent Progress in the Protection of Structural Timber from Organisms of Decay (Neuere Ergebnisse in der Bekämpfung der im Hochbaue Auftretenden Holzzerstörenden Pilze). Basilius Malenkovic. Giving a list of the latest antiseptic preparations for the prevention of decay in timber, and a bibliography of recent writings on the subject. 3000 w. Zeitschr d Oesterr Ing u Arch Ver—Feb. 9, 1906. No. 75127 D.

The Shirley Plant of the Columbia Creosoting Company. Illustrated description of this plant in Indiana which is notable for its advanced ideas in timber preserving practice. 2000 w. R R Gaz—Vol. XL, No. 11. No. 75552.

The Santa Fe's Modern Timber Treating Plant at Somerville. G. B. Shipley. Illustrated detailed description of a plant in Texas to be operated on the Rueping patented creosoting process. 4800 w. Ry Age—March 23, 1906. No. 75814.

Preservation of Timber. Prof F. H. Bass. Deals with preservation processes, especially considering the creosoting process. Ills. 2000 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77511 N.

The Timber Creosoting Plant at Shirley, Ind. H. H. Knowlton. Abstract of a paper read before the Indiana Engng. Soc. Describes a plant employing the Rueping process, which injects creosote oil under pressure. 3000 w. Eng News—Sept. 13, 1906. No. 79166.

Standard Specifications for the Grading of Structural Timbers. Illustrates defects occurring in structural timbers, giving description of these defects and a study concerning their influence on the strength of the timber, as reported by the committee of the American Society for Testing Materials. 1400 w. Eng Rec—Aug. 4, 1906. No. 78448.

## Timber Preservation.

New Tie and Timber Preserving Plant of the Atchison, Topeka and Santa Fe Ry. at Somerville, Texas. Describes the creosoting process used, the seasoning, inspecting and marking, the plant, machinery, equipment, etc. Ills. 4500 w. Eng News—May 3, 1906. No. 76474.

## Timber Treatment.

The Inspection of Treatment for the Protection of Timber by the Injection of

# CIVIL ENGINEERING

## Alignment

Creosote Oil. Discussion of paper by H. R. Stanford. 5500 w. Pro Am Soc of Civ Engrs—Jan, 1906. No. 74704 E.

## Wire Rope.

Notes on the Theory of Wire Rope (Beiträge zur Theorie der Drahtseile).

## MEASUREMENT

## Geodesy

Dr. Hans Benndorf. A continuation of the author's studies in July, 1904, comparing the computed elasticity of wire ropes with the results obtained by experiment. 7000 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 15, 1905. No. 74617 D.

# MEASUREMENT

## Alignment.

Co-ordinate Geometry Applied to Problems in Railroad Alignment. G. L. Bilderbeck. Reviews some of the fundamental principles showing their application to railroad work. 2000 w. Eng Rec—May 26, 1906. No. 76958.

## Beams.

A New Experimental Method of Determining the Location of the Neutral Axis in Reinforced Concrete Beams. F. D. Warren. Describes a direct method of locating the neutral axis, governed by accepted laws of mechanics. 1000 w. Eng News—Aug. 23, 1906. No. 78694.

## Current Meter.

The Ott Current Meter of the Swiss National Hydrometric Bureau (Die Ott'schen Flügel des Eidgenössischen Hydrometrischen Bureaus). An illustration of the standard propeller meter as used for measuring the flow of water in streams; full details are given as shown at the Milan exposition. 3000 w. Schweiz Bauzeitung—Oct. 6, 1906. Serial. Part I. No. 79975 B.

## Curves.

The Plotting and Rectification of Curves Applied to the Quadrature and Determination of the Centre of Gravity of Circular Arcs (Die Bogenstreckung und die Streckenbiegung angewendet zur Geviertung und zur Bestimmung des Schwerpunktes von Kreisteilen). Eduard Linsel. Deriving a number of convenient geometrical constructions for the rectification of curves. 4000 w. Zeitschr d Oesterr Ing u Arch Ver—Feb. 23, 1906. No. 75733 D.

## Densities.

Use of the Volumetrometer in the Determination of Densities. Floyd R. Watson. Reports an investigation made to test the accuracy of working of the volumetrometer, and to compare it with the Le Chatelier Flask as a means of measuring densities. The substance selected for comparison was Portland cement. 1400 w. Technograph—No. 20. No. 77163 D.

## Earthwork.

The Determination of Profiles in Excavation and Embankment Work of Trapezoidal Section (Beitrag zur Konstruktion des Flächenprofils bei Trassierung von Verkehrswegen mit Trapezoidischem Querprofile des Kunstkörpers). Karl Allitsch. Deriving a graphical method, with table to facilitate the work. 2000 w. Oesterr Wochenschr f d Oeffent Baudienst—Nov. 4, 1905. No. 73366 B.

## Earth Pressure.

A Determination of Actual Earth Pressure from a Cofferdam Failure. Thomas C. J. Baily, Jr. An account of the investigation of the failure of a portion of a cofferdam, illustrating the conditions. 900 w. Eng News—Aug. 16, 1906. No. 78584.

## Eye-Bars.

Stresses in Eye-Bars. Remarks on the tests made by John D. Van Buren on a rubber model of an eye-bar when subjected to tensile stresses. 1500 w. Engng—July 27, 1906. No. 78475 A.

## Excavation.

Calculations of Excavation. S. Napier Bell. Descriptions of methods of measuring the quantity of material excavated as work progresses. 3500 w. Mines and Min—Aug., 1906. No. 78492 C.

## Field Instruments.

Repairing Engineers' Field Instruments. E. M. Douglas. Suggestions for making temporary repairs and for the care of instruments. 1600 w. Eng News—Jan. 25, 1906. No. 74564.

## Force-Diagrams.

The Drawing of Force-Diagrams for Framed Structures. Archibald Sharp. Calls attention to a well-known geometrical relation between a frame diagram and the corresponding force diagram, of great utility in the actual drawing of the force diagram. 1000 w. Engng—Aug. 31, 1906. No. 79135 A.

## Geodesy.

The Complementary Geodetic Triangulation of the Higher French Alps (Sur

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## Horizometer

les Triangulations Géodésiques Complémentaires des Hautes Régions des Alpes Françaises). P. Helbronner. With a list of stations and altitudes, and a brief review of the field work. 1800 w. Comptes Rendus—Nov. 13, 1905. No. 73826 D.

The Curvature of the Geoid in the Simplon Tunnel (Les Courbures du Géoïde dans le Tunnel du Simplon). Marcel Brillouin. Data of observations in the Simplon tunnel showing the influence of external influences upon the measurements. 1200 w. Comptes Rendus—Sept. 10, 1906. No. 79915 D.

## Horizometer.

The Horizometer. Bradley A. Fiske. Describes an instrument by which the distance of an object at sea can be measured by measuring the angle of depression of its water-line below a horizontal line, drawn from the eye of the observer. Ills. 4000 w. Pro U S Nav Inst—Sept., 1906. No. 79846 F.

## Leveling.

Experience with the Prism Level on the United States Geological Survey. E. M. Douglas. Illustrates and describes this instrument, giving information of its working and cost. 2000 w. Eng News—May 17, 1906. No. 76678.

The Cséti Mine Leveling Instrument as Modified by Dolezal (Das Gruben-Nivellierinstrument von Cséti und seine Modifikation nach Prof. Dolezal). E. Dolezal. The improvements include the method of supporting the telescope, the graduation of the rod, and details of adjustment. The use of the instrument in the mine is shown. Serial. Part I. 3000 w. Oesterr Zeitschr f Berg u Huttenwesen—April 28, 1906. No. 76828 D.

## Maps.

The Use of Freehand Sketching in Preparing a Topographical Map. Prof. Arthur Lakes. Considers what should be shown and the manner of indicating it. Ills. 2500 w. Mines & Min—May, 1906. No. 76514 C.

## Metraphotography.

The Reconstruction of Architectural Monuments from Photographs (Sur le Relève des Monuments d'Architecture d'Après leurs Photographies). M. Laussedat. A discussion of the method of combining a number of photographs from various points to form an accurate record of actual dimensions and position. 3000 w. Comptes Rendus—Feb. 19, 1906. No. 75721 D.

## Photogrammetry.

The Photographic Measurement of Ocean Waves (Photographische Messung

## MEASUREMENT

## Surveying

der Meereswellen). W. Laas. A fully illustrated description of the application of methods of photographic surveying to the measurement of sea waves, during a voyage to and from South America. Three articles. 8000 w. 3 plates. Zeitschr d Ver Deutscher Ing—Nov. 25, Dec. 2, 9, 1905. No. 73802 each D.

The Use of Tentative Photography in the German Navy for Exploration Work (Sur Plusieurs Tentatives Poursuivies dans la Marine Allemande pour Utiliser la Photographie dans les Voyages d'Exploration). A. Laussedat. A discussion of the work of Laas, in measuring ocean waves on the Preussen, comparing the method of intersections with the method of parallaxes. 2500 w. Comptes Rendus—June 11, 1906. No. 78124 D.

## Prismoidal Formula.

A New Form of Procedure for Earth-Work Computations and a Slide Rule Therefor. C. W. Crockett. Explains the use of the prismoidal formula and the cases to which it is applicable, indicating the process that led to the general rule, and the circular slide rule prepared by the writer. 2800 w. Eng News—Dec. 21, 1805. No. 73978.

## Plotting.

Notes on Plotting Profiles. L. A. Waterbury. A discussion of the methods of constructing profiles and the things that should be shown. 3500 w. Technograph—No. 20. No. 77169 D.

## Seismographs.

Earthquake Records and Their Interpretation. Gives an actual record of an earthquake showing some of the irregularities, with explanation. 2000 w. Engng—June 29, 1906. No. 77891 A.

Seismograph and Magnetograph Records of the San Francisco Earthquake, April 18, 1906. Dr. L. A. Bauer. A study of seismograph and magnetograph records, and of why an earthquake will at times be recorded by magnetic instruments, and at other times leave no record. 4000 w. Pop Sci M—Aug, 1906. No. 78257 C.

The Investigation of the San Francisco Earthquake. G. K. Gilbert. An illustrated sketch of the physical features of the California earthquake, with explanation of the causes. 5000 w. Pop Sci M—Aug, 1906. No. 78256 C.

## Surveying.

Meridian Diagrams. Charles Arthur Albert Barnes. Describes certain practical methods which have proved satisfactory. 1700 w. (No. 3531.) Inst of Civ Engrs. No. 73173 N.

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## Surveying

Methods of Rod-Holding in Stadia Surveying and Description of a New Stadia Slide Rule. Arthur L. Bell. Describes the two methods of rod or staff holding now in use, and the circular slide rule for reducing stadia readings designed by the writer. Ills. 2500 w. Eng News—Nov. 9, 1905. No. 73082.

Stadia in Careful Work. Alfred H. Webb. Describes methods used by the writer, discussing variations in practice. 2000 w. Min Rept—Feb. 1, 1906. No. 74834.

Pathfinding for Canada's New Transcontinental Railway. H. V. Ross. Deals with the work of survey between Winnipeg and Moncton; which is to be built by the Dominion Government at an estimated cost of \$100,000,000. Ills. 5500 w. Eng News—Feb. 1, 1906. No. 74803.

Surveys for New York State Road Improvements. C. W. Trumbull. Read at Cornell Univ. An account of the methods of carrying out the necessary preliminary work for the extensive improvement of public highways now in progress. 5500 w. Eng Rec—Dec. 9, 1905. No. 73672.

Public Land Surveys by Government Engineers in Indian Territory. Charles H. Fitch. A record of work done in 1895 in the survey and subdivision of nearly 31,000 square miles of land. 1200 w. Eng News—Feb. 8, 1906. No. 74916.

Corrections for Instrumental Errors in Topographical Surveying (Compensation des Erreurs Instrumentales dans les Opérations Topographiques). H. Nau-din. A review of the various errors of the theodolites, levels, and other geodetic instruments, with methods for calibration and correction. 5000 w. Revue Technique—Nov. 25, 1905. No. 73839 D.

Mineral Land Surveying. James Underhill. Presents methods used at the present time for the survey of mineral lands in the western part of the United States. 1700 w. Min Rept—Dec. 7, 1905. Serial. 1st part. No. 73662.

Note on a New Instrument for Surveying Deep Bore Holes. J. B. Porter. Briefly outlines the usual methods of surveying bore holes, and gives a description of an apparatus invented by Wm. Helme, of Johannesburg. 1500 w. Ills. Can Soc of Civ Engrs—Nov. 30, 1905. (Adv. proof.) No. 74090 C.

Tide Levels and Datum Planes on the Pacific Coast of Canada. W. Bell Dawson. Gives results with regard to datum planes and bench-marks as far as determined. 8800 w. Can Soc of Civ Engrs—Jan., 1906. No. 75616 D.

## MEASUREMENT

## Surveying

Common Sources of Error in Field Work. A. M. Shaw. Gives sources of error and their suggested remedies. 700 w. Eng News—April 19, 1906. No. 76131.

Field Methods of Triangulation in the Plains Country in Montana. John T. Stewart. Abstract of a paper read at the annual meeting of the Illinois Soc. of Engrs. & Survs. Describes the field methods of triangulation used in Montana in establishing geodetic positions for the control of a topographic survey. 5500 w. Eng News—April 12, 1906. No. 76050.

Surveying on the Farm. A. S. Kenyon. Explains the use of the miner's triangle, the water level, leveling operations, and boring rods. Ills. 1800 w. Sci Am Sup—April 28, 1906. No. 76383.

Surveying on the Farm. A. S. Kenyon, in *Jour. of Agri.* (Victoria). Explains the measurement of areas, the prismoidal formula, and other calculations. Diagrams. 4000 w. Sci Am Sup—June 2, 1906. No. 77049.

The Mayer and Wiesmann Theodolite (Tachéomètre A. Mayer et E. Wiesmann). L. Fonjallaz. Illustrating and describing an improved transit-theodolite, especially adapted for tunnel work and used in connection with the work on the Simplon Tunnel. 2500 w. Bull Tech de la Suisse Romande—April 10, 1906. No. 76266 D.

Geodetic and Magnetic Work in the Vicinity of Tananarive (Travaux Géodésiques et Magnétiques aux Environs de Tananarive). Ed Colin. A report on the progress of the official French survey of Madagascar. 1500 w. Comptes Rendus—May 21, 1906. No. 77644 D.

Azimuth Circles with Microscopes for Surveying Work (Cercle Azimutal du Service Technique du Cadastre). Ch. Lallemand. Describing an improved type of theodolite of a high degree of precision, with tests by the Ponts et Chaussées. 1000 w. Comptes Rendus—June 5, 1906. No. 78127 D.

Azimuth, Latitude and Time from Polaris, and a Southern Star, with Surveyor's Transit. George O. James. Explains a rapid and convenient method which gives a very good approximation of the azimuth of the Pole Star at the instant of bisection. 1500 w. Jour Assn of Engrg Soc's—Aug., 1906. No. 79892 C.

Surveying Without Instruments. A. L. de Leeuw. Explains how work of sufficient accuracy for many cases may be done without the ordinary surveyor's

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### Testing

instruments. Gives examples. 2000 w. Mach, N Y—July, 1906. No. 77703 C.

Final Results of the Simplon Tunnel Survey. Prof. Dr. M. Rosenmund, in *Schweizerische Bauzeitung*. 2600 w. Bul Int Ry Cong—Aug., 1906. No. 79282 E.

Measurement of Base Lines. A brief review of old and new methods, the improvements and related advancement. 1800 w. Engr, Lond—Aug. 31, 1906. No. 79146 A.

The Northern Boundary of Massachusetts. Nelson Spofford. Gives briefly the history of the New Hampshire boundary and the controversy with Massachusetts, the old methods of surveying, the re-surveys in 1825 and in 1885, and the Vermont boundary. Also a statement by Frank W. Hodgdon on the way the line has been established. 7800 w. Jour Assn of Engng Socs—July, 1906. No. 79725 C.

### Testing.

The New Hydraulic and Cement Testing Laboratories at the University of Pennsylvania. Illustrated description of this new building and its equipment. 4500 w. Eng Rec—Oct. 20, 1906. No. 79885.

### Theodolite.

Some Surveying Instruments. An illustrated description of a special theodolite, made by Mr. Coradi, of Zürich, and a tacheometer, invented by Herrn. Mayer, and Wiesmann, engineers on the Simplon Tunnel. 1700 w. Engr, Lond—Dec. 15, 1905. No. 74057 A.

### Tide Indicators.

Tide Level Indicators with Pneumatic Transmission (Indicateurs de Hauteur d'Eau à Courant d'Air Continu). MM. Vidal & Kauffmann. The pencil of a recorder is moved by the varying degree

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### Cuba

of Compression of air in a closed vessel according to the variations in head of water. 3000 w. Ann d Ponts et Chaussées—2 Trimestre, 1905. No. 75772 E + F.

### Transit.

Specifications for an Engineer's Transit and Level. L. S. Smith. A discussion of the best type of transit for topographic work, the changes needed, &c. Also engineer's leveling instruments. Ills. 4200 w. Wis Engr—Dec., 1905. No. 73750 D.

### Transition-Curves.

A Simplified Method of Laying Out Transition-Curves. Thomas Alexander Ross. Gives a transition-curve table, explaining its use. 700 w. Inst of Civ Engrs—No. 3585. No. 79519 N.

### Triangulation.

The Triangulation and Construction Survey for the Simplon Tunnel. Horace Andrews. A summary of the work involved in the triangulation and the construction-surveys. 3000 w. Eng News—Dec. 21, 1905. No. 73982.

### Water Meters.

Resolutions of the Philadelphia City Council against Water Meters. A copy of the resolutions with brief editorial comment. 1500 w. Eng News—March 22, 1906. No. 75652.

### Wind Pressure.

A Recording Device for Measuring Wind Pressure (Registrierender Winddruck-Messapparat). Rudolf Müller. The direct pressure exerted on a square plate is transmitted to a recording drum; the force being opposed by a counterweight. 2000 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Dec. 9, 1905. No. 73874 D.

## MUNICIPAL

### Asphalt Plant.

An Asphalt Plant for Walks and Crossings in Small Cities. H. B. R. Craig. Describes an asphalt plant operated by the city of Kingston, Ont., for the past twelve years. 1000 w. Can Soc of Civ Engrs—Dec. 14, 1905. (Adv. proof.) No. 74088 C.

### Boulevard.

Recent Work on the Extension of Riverside Drive. Illustrates and describes recent work above 135th Street, on this beautiful boulevard at New York City. 2500 w. Eng Rec—Sept. 15, 1906. No. 79160.

### Conduits.

Conduit Construction Through Saw Mill Refuse. Illustrated description of unusual conduit construction at the Parke-Davis works in Detroit, Mich. A water pipe, outfall sewer and pipe conduit were all laid in the same trench. 1300 w. Eng Rec—May 5, 1906. No. 76528.

### Cuba.

Sanitary Conditions in Cuba. Cristino Figuerola Cowan. An illustrated article discussing Havana's great advancement in plumbing and sewerage work. 2000 w. Met Work—June 23, 1906. No. 77425.



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## Curbs

### Curbs.

Suggestions Covering Combined Curb and Gutter. Albert Moyer. Gives outlines for specifications for the manufacture of monolithic cement stone. 1800 w. Eng Rec—Nov. 4, 1905. No. 73060.

### Destructor.

The Combined Rubbish Destructor and Power Plant in New York. An illustrated detailed description of the Williamsburg bridge plant, its equipment and operation. 4000 w. Eng Rec—Nov. 11, 1905. No. 73139.

Destructors and Their Bye-Products. F. L. Watson. Abstract of a paper read before the Leeds Loc. Sec. of the Inst. of Elec. Engrs. Describes the means of feeding in use, systems of storing, the methods of taking of the gases of combustion, &c., and matters relating to the plant generally. 4000 w. Elec'n, Lond—Dec. 1, 1905. No. 73683 A.

Refuse Destructor Combined with Electric Light Plant at Westmount, P. Q. Describes and illustrates a plant for a town of about 12,000 inhabitants, near Montreal. Gives a test of the destructor and boiler. 3000 w. Eng News—May 24, 1906. No. 76785.

Refuse Destructors. H. Norman Leask. Briefly reviews the history and evolution of types of furnaces, discussing technical points, and reporting tests. 9000 w. Ills. Trans of Inst of Engrs & Shipbldrs in Scotland—March 20, 1906. No. 76696 D.

A Combined Municipal Refuse Destructor and Electric Generating Station. Illustrated description of a plant in Canada, combining a refuse destructor and electric lighting station. 1200 w. Eng Rec—Aug. 18, 1906. No. 78642.

A Rubbish Incinerator Plant in Brooklyn. Illustrates and describes the plant of the American Railway Traffic Co., which has the contract for disposal of the city waste, the plant being utilized in a large repair shop plant. 3000 w. Eng Rec—Aug. 25, 1906. No. 78808.

### Disinfection.

The Municipal Electrolytic Hypochlorite Plant at Poplar. An installation for the purpose of supplying a cheap disinfectant for municipal use, in substitution for disinfectants made from coal tar derivatives, which are slow in action. Ills. 1000 w. Elec Rev, Lond—June 8, 1906. No. 77381 A.

### Dust.

The Oiling of Roads (Gondronnages des Routes). M. Guillet. An account of the results effected by the use of oil to

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## Garbage

prevent dust on roads in the departments of Seine and Marne, from 1903 to 1905. 4000 w. Ann des Ponts et Chaussées—4 Trimestre, 1905. No. 75781 E + F.

The Suppression of Dust on Roads by Oil Sprinkling. An account of method, cost, etc., of this treatment of streets and roads as carried out at North Sydney, N. S. W. 1500 w. Engng—July 13, 1906. No. 78218 A.

### Fire Hazards.

Fire Hazards and How to Avoid Them. Washington Devereux. A statement of existing conditions from the fire hazard standpoint, with suggestions for care and construction of buildings. 5500 w. Casier's Mag—Jan., 1906. No. 74462 B.

### Fire Loss.

The San Francisco Disaster: Earthquake and Fire Ruin in the Bay Countries of California. An account of this disaster, with map showing the approximate extent of the burned district. 4500 w. Eng News—April 26, 1906. No. 76343.

### Fire Prevention.

Fire, Fire Risks and Fire Prevention. Vivian B. Lewes. Discusses the subject from the scientific standpoint. 5000 w. Jour Soc of Arts—Aug. 17, 1906. Serial 1st part. No. 78835 A.

### Fire Protection.

Fire Protection in Cities. S. H. Lockett. Discussing the development of water-works systems and public fire departments in American cities. 6000 w. Ins Engng—July, 1906. No. 78244 C.

See Civil Engineering, Water Supply.

### Fire Service.

Electricity in the Service of the Fire Brigade. Frank Broadbent. Reviews some applications that have already been noticed, and remarks that the chief difficulty is in obtaining a supply of electricity near the scene of the fire. 1800 w. Elec Rev, Lond—Jan. 19, 1906. No. 74737 A.

### Galveston.

The Relocation of Public Service Systems During the Grade Raising of Galveston, Tex. An illustrated article explaining how some of the problems arising from raising the grade of the lower part of the city were solved. The relocation of gas and water pipes, sewers, street railway tracks, etc. 4000 w. Eng Rec—Sept. 15, 1906. No. 79162.

### Garbage.

Garbage Disposal. Joseph G. Branch. Advocates incineration in preference to reduction for city refuse. 900 w. Munic Jour & Engr—Jan., 1906. No. 74133 C.

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## Harbor Pollution

A Notable Report on Garbage and Refuse Collection and Disposal at Columbus, O. Reviews the report and detailed estimates submitted and approved by experts, for a plant for the collection and disposal of garbage and rubbish, and the cost of maintaining and operating it. 3300 w. Eng News—March 15, 1906. No. 75533.

Garbage Disposal by Reduction Methods. D. Robert Yarnall. Describes the differences found in the character of the waste of different cities, and in the quality of the garbage, the methods of collection and disposal, and the reduction method used in New York City, known as the Arnold system. 5500 w. Pro Engrs Club of Phila—July, 1906. No. 78599 D.

## Harbor Pollution.

The Pollution of Tidal Waters of New York City and Vicinity. George A. Soper. A study of the proposal to empty sewage from New Jersey into New York Bay without purification. Discusses the problem from a sanitary standpoint. Also general discussion. 12600 w. Jour Assn of Engng Socs—June, 1906. No. 79268 C.

## Incinerating Plant.

The New York Rubbish Incinerating Plant. S. D. V. Burr. Illustrated detailed description of this plant, which is utilized in lighting the Williamsburgh Bridge. 2000 w. Ir Age—Feb. 8, 1906. No. 74904.

## Improvements.

New Paving and Sewerage Work at Fort Smith, Ark. George Myers. Outlines extensive improvements to be carried out in a small city. 500 w. Eng News—Sept. 6, 1906. No. 79090.

## Municipal Improvements.

A New Year's Survey of Municipal Conditions. Editorial on the great increase in facilities that were formerly confined to large cities, and the number of industries owned municipally. Discusses also various classes of work done by municipalities, and the recent progress. Considers the outlook most promising. 4000 w. Eng News—Jan. 4, 1906. No. 74175.

## Municipal Ownership.

See Industrial Economy.

## Municipal Transit.

A Suggested Solution of Metropolitan Transit. W. Jones Cuthbertson. States the objections to the systems now in use and discusses a system having the railroad on the surface and the common road above it, describing details. Ills. 5500 w. Jour Assn of Engng Socs—June, 1906. No. 79267 C.

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## Parks.

The Preservation of Open Spaces in Large Cities (La Conservation des Espaces Libres dans les Grandes Villes). A. Bidault des Chaumes. A discussion of the importance of municipal parks, with illustrations from Paris, London, Berlin, and other cities. 3000 w. Génie Civil—June 16, 1906. No. 78121 D.

## Pavements.

Brick Paving. Discusses present day methods and the details that will insure good construction, materials, &c. 3000 w. Munic Jour & Engr—Dec., 1905. No. 73514 C.

Brick vs. Asphalt Pavements. An illustrated article showing cost of construction and repairs of the rival pavements in Syracuse, N. Y. 1000 w. Brick—Dec., 1905. No. 73579.

Street Pavements in Chicago. John W. Alvord. Describes past and present conditions of the streets, and considers the progress and future outlook. 2000 w. Jour W Soc of Engrs—Dec., 1905. No. 74552 D.

Vitrified Brick for Paving Purposes. Directions for laying brick pavements prepared from the experience of eminent engineers. 2500 w. Eng Rec—April 14, 1906. No. 76320.

Benefits of Pavements. Ira O. Baker. Read before the Illinois Clayworkers' Assn. Presents the advantages and disadvantages of pavements, cost, etc. 2000 w. Munic Engng—June, 1906. No. 77304 C.

The Municipal Asphalt Repair Plant at Pittsburg, Pa. Charles Brossmann, Jr. Illustrated description of the plant and its operation. 1200 w. Eng News—May 31, 1906. No. 77038.

Evolution of Street Pavements. George W. Tillson. On the materials formerly, and at present used; the reasons for changes; properties, costs, etc. Ills. 3700 w. Munic Jour & Engr—June 6, 1906. No. 77192.

Washington and Street Paving. An account of the pavements used in the national Capital of the United States, the conditions, average cost and statistics. 2500 w. Munic Jour & Engr—June 6, 1906. No. 77194.

The Construction of Pavements in Chicago. Abstract of a paper by J. A. Moore, read before the Illinois Soc. of Engrs. & Survs. An explanation of the actual construction work; considers lines and grades, foundations, granite block, brick, asphalt, macadam, etc. 3500 w. Eng Rec—Feb. 3, 1906. No. 74863.

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## Refuse

Recent Developments in Wood Block Paving. F. A. Kummer. Abstract of a paper read before the Munic. Engrs. of the City of N. Y. Information concerning the materials used and the treatment of the blocks, the manner of laying, and related matters. 2800 w. Eng Rec—Aug. 25, 1906. No. 78806.

The Construction of Brick Pavements. Abstract of some of the special features in the specifications approved by the Nat. Paving Brick Mfrs' Assn., with explanatory remarks. 3000 w. Eng News—Aug. 30, 1906. No. 78900.

## Refuse.

The Utilization of Refuse by Triple Sorting (Müllverwertung, Insbesondere nach dem Dreiteilungsverfahren). Dr. Hans Thiesing. A discussion of the refuse disposal problem, showing the advantages of a careful separation of the ashes, organic matter, and utilisable material from refuse, passing the second only to the destructor. 6000 w. Zeitschr d Oesterr Ing u Arch Ver—Jan. 19, 1906. No. 75122 D.

Disposal of Municipal Refuse, and Rubbish Incineration. H. de B Parsons. Gives data on the subject of municipal refuse and describes the rubbish incinerating plant in Delancey Slip, Manhattan, with the adjoining electric lighting station, which utilizes the heat produced to light the Williamsburg Bridge. Ills. 6500 w. Pro Am Soc of Civ Engrs—April, 1906. No. 76391 E.

Purification of Slaughter-House Refuse at Zerst, Germany. William H. Schladitz. A detailed description of the careful and sanitary manner of disposal enforced in Germany. 1800 w. Munic Engng—Aug., 1906. No. 78361 C.

Disposal of Dye and Wool Finishing Waste. Herman Stabler. From a report to the Ohio State Board of Health. An investigation of the effluent of the Cleveland Worsted Mills Co., located at Ravenna, Ohio. 4500 w. Munic Engng—Sept., 1906. No. 79270 C.

Refuse Destructor Plant for the City of Brunn, Austria (Die Müllverbrennungs Anlage der Stadtgemeinde Brunn). Sigmund Kander. Illustrating the arrangement of the cremator furnaces, and steam plant, and diagrams showing operation. Two articles. 5000 w. Elektrotech u Maschinenbau—Sept. 9, 16, 1906. No. 79364, each D.

The Disposal of House Refuse (Die Beseitigung von Hausmüll). Dr. Klemens Dörr. Giving physical and chemical analyses of the refuse of various German cities, and discussing the practicability of its use as fuel. Three articles.

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7500 w. Zeitschr d Oesterr Ing u Arch Ver—Aug. 17, 24, 31, 1906. No. 79325, each D.

## Roads.

Road Tarring in France. Illustrates and describes methods and appliances used for this work. 1200 w. Sci Am—Sept. 15, 1906. No. 79174.

## Sanitation.

Experimental Methods as Applied to Water and Sewage-Works for Large Communities. George W. Fuller. One of several papers prepared in commemoration of the twenty-fifth anniversary of the doctorate of Prof. William T. Sedgwick. Discusses sanitary science, the new conditions, and methods being tried to meet their requirements. 6000 w. Eng Rec—July 21, 1906. No. 78079.

Sanitary Science and the Public Health. Leonard P. Kinnicutt. Commencement lecture. Especially considering modern methods of sewage disposal. Ills. 4000 w. Jour Worcester Poly Inst—July, 1906. No. 78004 C.

Sanitation of the City of Washington. Benjamin Winslow. Illustrated descriptions of the aqueduct and filtration plant are given in the present number. 1600 w. Sci Am—Sept. 1, 1906. Serial. 1st part. No. 78904.

## Sewage.

Sewage Disposal at Berlin, Ont. A sewage plant, comprising two septic tanks, two storage tanks, a pumping station, and 14 acres of intermittent sand filters, is illustrated and described. 2400 w. Eng Rec—Dec. 23, 1905. No. 74017.

Sewage Disposal for Mansions and Large Country Houses. A. S. Goodridge. Read before the Inst. of San. Engrs. Considers methods of disposal, advocating the natural or earth processes wherever it is possible to apply them. 4000 w. Dom Engng—Dec. 9, 1905. No. 73649.

The Bacterial Purification of Sewage. Albert Glyndon. Gives a brief description of the more important systems of sewage disposal now in use. Ills. 2500 w. Sci Am—Dec. 9, 1905. No. 73631.

Sewage Purification, with Notes on English and German Works. Charles F. Mebus. Principally a discussion of English works, with brief notes on German works. General discussion. 6000 w. Pro Engrs' Club of Phila—Jan., 1906. No. 74533 D.

The Scientific Disposal of City Sewage: Historical Development and Present Status of the Problem. C. E. A. Winslow. Discusses briefly the various methods tried in both Europe and America, and gives the

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opinion that only experimentation in each case will determine what method is most desirable. 6500 w. Tech Qr—Dec., 1905. No. 74584 E.

The Sewage Purification Works at Columbus, Ohio. Julian Griggs. Illustrates and describes the purification works to be built as a result of the investigations during one year to ascertain the most efficient and economical method of purifying the dry weather sewage flow. The method comprises septic tanks, sprinkling filters and settling basins. 3800 w. Eng Rec—Dec. 30, 1905. No. 74135.

The Tankage of Sewage. F. Wallis Stoddart. Read before the Roy. Inst. of Pub. Health. Discusses the causes of offensive odors. Tank capacity, secondary deposits, rate of flow through tank, and sludge disposal are considered. 5000 w. Munic Engng—Jan., 1906. No. 74188 C.

West Riding Rivers. Begins a detailed history of the Bradford sewage disposal question, showing the difficulties of the West Riding Rivers Board in its struggle against river pollution. 4000 w. Engng—Jan. 10, 1906. Serial. 1st part. No. 74745 A.

What Methods Are Most Suitable for Disposal of Sewage on the Atlantic Coast? George W. Fuller. Address at meeting of the New Jersey Sanitary Assn. Considers briefly recent additions to the evidence upon the subject of sewage disposal, and the practical conclusions now available. 3000 w. Eng News—Jan. 25, 1906. No. 74566.

Sewage Purification and Refuse Incineration Plant, Marion, Ohio. George H. Pierson. Illustrates and describes the plant and method of operation. 4500 w. Eng Rec—March 17, 1906. No. 75569.

Disposal Plants in the State of Wisconsin. John F. Icke. An illustrated article reviewing the plants and processes in use. The plant at Madison is fully described and reported. 11500 w. Wis Engng—March, 1906. No. 76094 D.

Report on Sewage Purification Experiments at Columbus, O. A summary review of the tests, as given by George A. Johnson, with editorial. 5000 w. Eng News—April 5, 1906. No. 75952.

The Johannesburg Municipal Sewage Scheme from a Bio-Chemical Point of View. W. C. C. Pakes sketches the proposed scheme and discusses it from the view of modern facts and theories. Considers it sound from both a sanitary and commercial point of view. Discussion. 7500 w. Jour Chem, Met, & Min

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Soc of S Africa—Feb., 1906. No. 76146 E.

A German Sewage Disposal Plant. William H. Schladitz. Describes the works at Naumburg on Saale. Also water purification. Ills. 1500 w. Munic Jour & Engr—May 2, 1906. No. 76491 C.

Biological Methods of Sewage Disposal for Farm Houses, Country Estates and Summer Resorts. William Paul Gerhard. An explanation of the principles of the bacterial methods, illustrating their practical application by examples. 5200 w. Met Work—May 5, 1906. No. 76496.

Pasadena Sewer Farm. S. F. Pearson. An illustrated account of a very satisfactory method of sewage disposal, stating some of the obstacles encountered and the success attained. 2000 w. Munic Jour & Engr—May 2, 1906. No. 76489 C.

Sewage Purification for Columbus, Ohio. George A. Johnson. Explains local conditions, the processes tested, and the final conclusions. 3300 w. Munic Jour & Engr—May 2, 1906. No. 76492 C.

The Purification of Municipal Sewage (Städtische Abwasser und seine Reinigung). H. Bredtschneider. A discussion of the chemical and bacterial methods of sewage purification, and the conditions for which each method is applicable. Two articles. 7500 w. Gesundheits Ingenieur—March 17, 31, 1906. No. 76838 each B.

Notes on Sprinkling Filters for Sewage Treatment. George W. Fuller. A résumé of American and foreign experience. 5800 w. Eng Rec—June 23, 1906. No. 77427.

Sewage Disposal at Manchester and Birmingham. Leonard Parker Kinnicutt. An illustrated account of these English plants, one being an example of the contact bed treatment and the other of the percolating filter process. 2500 w. Jour Assn of Engng Soc's—March, 1906. No. 77319 C.

The Intermittent Filtration of Sewage as Practiced in America. Leonard P. Kinnicutt. Address before the Royal Inst. of Public Health, London. Confined to the purification of sewage by intermittent filtration through prepared sand-beds, as practiced in Massachusetts. 3000 w. Jour Worcester Poly Inst—May, 1906. No. 77155 C.

Report of the Board of Advisory Engineers of the Sewerage Commission of Baltimore. A report of the conclusions reached in regard to the problem of sewage treatment with the object of obtaining "the highest practicable degree of pur-

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ity." 6000 w. Map. Eng Rec—July 28, 1906. Serial. 1st part. No. 78275.

The Operation of Sewerage Works. A number of papers by different writers, reporting the systems in use at various places, mostly isolated plants for schools, colleges, sanatoriums, etc. Ills. 5800 w. Jour Assn of Engng Socs—April, 1906. No. 78237 C.

The Purification of Sewage and Industrial Wastes (Epuraton des Eaux d'Egout et des Eaux industrielles). B. Bezault. A review of the bacterial process of sewage purification, with examples from British and French installations. 10,000 w. Bull Soc d'Encour—May 31, 1906. No. 78174 G.

The Purification of Waste Water (Epuraton des Eaux Usées). M. Michel. An exhaustive review, historical and technical of the development of modern methods of sewage purification, with especial reference to bacterial processes in France. Serial, Part I. 15,000 w. Ann d Ponts et Chaussées—I Trimestre, 1906. No. 78130 + F.

Engineers' Report on a Comprehensive Sewage Purification Plant for Baltimore, Md. The plan proposed includes septic tanks, sprinkling or percolating filters, settling basins and intermittent sand filters, all of sufficient capacity to treat 75,000,000 gals. daily. 2500 w. Eng News—Aug. 16, 1906. No. 78585.

Sewage Disposal. An informal discussion at the annual convention, June 28, 1906, on the advance in sewage disposal. 14800 w. Pro Am Soc of Civ Engrs—Aug., 1906. No. 78875 E.

The Disposal of Sewage. Antony Roche. Outlines the systems most in use. 1800 w. Munic Jour and Engr—Aug. 1, 1906. No. 78380 C.

The Disposal of the Sewage of Paterson, N. J. Allen Hazen. Considers the method of treatment best adapted for the purification of a municipal sewage containing large amounts of mill matter. 4000 w. Eng Rec—Aug. 11, 1906. Serial. 1st part. No. 78496.

The Trickling Filter at the Sewage Experimental Station of the Massachusetts Institute of Technology. C.-E. A. Winslow and Earle B. Phelps. An illustrated description of the septic tank and trickling filters under trial. 2000 w. Eng News—Aug. 16, 1906. No. 78583.

Design of Works for Bacterial Treatment of Sewage. From a paper by J. S. Pickering read before the British Congress of the Roy. San. Inst. Describes the works of purification. 2400 w. Builder—Sept. 1, 1906. No. 79106 A.

Report of a London Engineer on Sewage Disposal at Toronto, Ont. Reviews the report on the Toronto sewage problem made by G. R. Strachan. 2000 w. Eng News—Sept. 6, 1906. No. 79098.

Sewage Purification Works and the Health of the Community. J. Ashton. Part of a paper read before the Inst. of San. Engrs. Reviews the progress in England relating to sewage purification and river pollution. 2200 w. Builder—Sept. 1, 1906. No. 79108 A.

Sludge Treatment in Relation to Sewage Disposal. John D. Watson. Read at meeting of the Assn. of Munic. & Co. Engrs. Also editorial. A valuable report of results at Birmingham, England. Deals with the arresting and disposal of the solids, and the precipitating of organic sludge and converting it into an inodorous substance. 6000 w. Eng Rec—Sept. 1, 1906. No. 78930.

A Method for Testing and Comparing Sewage Sprinklers. Earle B. Phelps. A preliminary description of the methods of testing employed at the Sewage Experiment Station of the Massachusetts Institute of Technology, and of the mathematical analysis of the results. 2200 w. Eng News—Oct. 18, 1906. No. 79834.

Discussion of Papers 3560 and 3599. Joint discussion of papers by David Ernest Lloyd-Davies and by Alfred Stowell Jones and William Owen Travis. Ills. 45000 w. Inst of Civ Engrs—Jan. 16 and 23, 1906. No. 79512 N.

Experience With Fine-Grain Percolating Filters for Sewage. Statements from the report of Dr. George Reid concerning experiments made in connection with the operation of a sewage filter at Hanley, England. 2200 w. Eng Rec—Oct. 20, 1906. No. 79888.

Experience with Intermittent Filtration of Sewage at Worcester, Mass. Reviews the recent report of Harrison P. Eddy concerning the operation of these filters. 5000 w. Eng Rec—Oct. 13, 1906. No. 79787.

On the Elimination of Suspended Solids and Colloidal Matters from Sewage. Alfred Stowell Jones, and William Owen Travis. Discusses the constituents of sewage, their qualities and methods of displacement, claiming that bacteria play only an auxiliary part in the purification, and showing the necessity for complete removal of several matters before the final oxidation processes. Ills. 10000 w. Inst of Civ Engrs—No. 3599. No. 79511 N.

The Advance in Sewage Disposal. An informal discussion of this subject at the

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annual convention, June 28, 1906. 4500 w. Pro Am Soc of Civ Engrs—Sept., 1906. No. 79535 E.

The Influence of the Saline Constituents of Sea Water on the Decomposition of Sewage. J. E. Purvis and C. J. Coleman, in the *Jour. of the Roy. San. Inst.* Aims to show how far the salts affect decomposition, and particularly with regard to the production of nitrates. 3000 w. Eng News—Oct. 11, 1906. No. 79717.

The Sewerage of Baltimore. Calvin W. Hendrick. An interesting account of this great project for treating 300,000,000 gallons of sewage per day, and the difficulties to be overcome. 3000 w. Munic Engng—Oct., 1906. No. 79732 C.

The Elimination of Storm-Water from Sewerage Systems. David Ernest Lloyd-Davies. A report of investigations and experiments made to obtain reliable information on the subject of storm-flow in underground channels, rates of rainfall, etc. 5000 w. Inst of Civ Engrs—No. 3560. No. 79510 N.

### Sewage Disposal.

Progress in the Work of Turning Chicago's Sewage Away from Lake Michigan. Editorial review of the present situation, and the work in progress on the intercepting sewer system 1400 w. Eng News—Nov. 9, 1905. No. 73084.

Reflections on Sewage Farming Suggested by Experiences at Reading, England. Editorial on sewage treatment and a review of a report on the operation of the Reading sewage farm. 3000 w. Eng News—Nov. 16, 1905. No. 73222.

The Operation of the Sewage Works of Manchester, England, 1904-5. A report of the operation of remodelled sewage works. 1700 w. Eng News—Nov. 2, 1905. No. 72964.

The Tankage of Sewage. F. Wallis Stoddart. Read before the Roy. Inst. of Pub. Health. A discussion of sewage treatment, describing experiments showing the effect of rate of flow, tank capacity, &c. 4200 w. Eng Rec—Nov. 18, 1905. No. 73252.

Combined Septic Tanks, Contact Beds, Intermittent Filters and Garbage Crematory, Marion, O. R. Winthrop Pratt. Illustrated detailed description of the sewage disposal plant and the garbage and refuse crematory. 5000 w. Eng News—Feb. 22, 1906. No. 75245.

The Sewage Disposal Plant at Downers Grove, Ill. W. S. Shields. Read before the Illinois Soc. of Engrs. & Survs. Illustrated description of a system of sand fil-

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tration following a septic treatment. 1600 w. Eng Rec—Feb. 3, 1906. No. 74865.

### Sewage Pumping.

Notes on the Working of the Shone System of Sewerage at Karachi. James Forrest Brunton. An account of trials, made with a view to ascertain the cause of the unsatisfactory working of the installation, with the results. 3300 w. Tables and diagrams. (No. 3436.) Inst of Civ Engrs. No. 73148 N.

The Sewage Pumping Station at the Hampton Institute. An illustrated detailed description of a sewerage system designed to serve about 1,000 people, living and working in separate buildings over a considerable area. 2500 w. Eng Rec—Nov. 18, 1905. No. 73248.

The Thirty-Ninth Street Sewage Pumping Station, Chicago. Illustrated detailed description of a station having a rated capacity of 900,000 gal. a minute. 4500 w. Eng Rec—Nov. 18, 1905. No. 73253.

### Sewers.

Breakage in Sewer Pipes. Information from a paper by Mr. Alexander Potter, of New York, read before the Boston Society of Civil Engineers. 1600 w. Eng Rec—Oct. 28, 1905. No. 72907.

The Broadway Outfall Sewer, Borough of the Bronx, New York. Illustrates and describes the twin sewer built to carry the combined sewage and storm water flow from the watershed of Tibbitt's Brook. Describes the construction. 2500 w. Eng Rec—Nov. 11, 1905. No. 73144.

The Sewerage of Douglas, Isle of Man. Edmund Herbert Stevenson, and Edward Knaston Burstal. A brief history of the sewerage of Douglas, with a description of the existing system recently carried out by the authors. Discussion. Ills. 14000 w. (No. 3510.) Inst of Civ Engrs. No. 73149 N.

Vitrified Tile Sewers as House Drains in Chicago. Perry L. Hedrick. States the conditions in Chicago, quoting from plumbing ordinances, and showing that a careful workman can lay a tile sewer so as to make it water tight and to withstand the specified pressure. 2000 w. Eng News—Nov. 2, 1905. No. 72957.

American Sewer Design and Construction. John S. Hodgson. With special reference to the metropolitan main drainage works, of Boston, Mass. 7500 w. Munic Jour & Engr—Dec., 1905. No. 73513 C.

Difficult Sewer Construction in Minneapolis. Illustrations, and brief description of sewers of concrete construction laid through land which was formerly the

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bed of the Mississippi River, and later a public dump ground. 600 w. Eng Rec—Dec. 2, 1905. No. 73576.

Joint Trunk Sewer of Eleven New Jersey Municipalities. Gives statistics of construction and illustrated description of notable details of this great work. 1800 w. Munic Engng—Dec., 1905. No. 73756 C.

Sewer Construction in Brooklyn. Explains the complications that have made necessary a number of large relief sewers, and much reconstruction of the existing sewers. 1700 w. Ills. Eng Rec—Dec. 2, 1905. No. 73573.

Breakage in Sewer Conduits: Its Cause, Effect and Prevention. Alexander Potter. Gives information based on a study of the Joint Trunk Sewer in New Jersey. Also discussion. 9500 w. Jour Assn of Engng Socs—Dec., 1905. No. 74379 C.

Outfall Works and Inverted Siphons for the New Sewerage System at Hamburg (Die Versenkung der Dükerrohre durch den Niederhafen und die Mündungsanlage der Neuen Stammsiele in Hamburg). Curt Merckel. Describing especially the construction and sinking of the inverted siphons for the new drainage system of Hamburg. Serial. Part I. 3000 w. Zeitschr d Ver Deutscher Ing—Jan. 13, 1906. No. 74609 D.

The Sewerage of Springfield, Ohio. W. H. Sieverling. The proposed works are described and illustrated. 1700 w. Munic Jour & Engr—Jan., 1906. No. 74134 C.

The Construction of the Tunnel Line Sewer at Syracuse, N. Y. Profile, plan and illustration, with description of work. 2200 w. Eng Rec—March 3, 1906. No. 75410.

The New Hamburg Main Sewer. Illustrates and describes interesting work in the extension of the Hamburg sewer system. 2200 w. Engr, Lond—March 9, 1906. No. 75603 A.

The Sewerage System of Centerville, Iowa. Notes on the design, construction and cost of a system to meet rather difficult topographical conditions, as described in a paper by Arthur J. Cox, before the Iowa Engng Soc. Ills. 2700 w. Eng Rec—March 24, 1906. No. 75687.

Breakage in Sewer Conduits: Its Cause, Effect and Prevention. Alexander Potter. Read before the Sanitary Sec. of the Boston Soc. of Civ. Engrs. Gives facts bearing on this subject, and discusses the behaviour of cement and vitrified pipe and sewer construction. 3500 w. Munic Engng—April, 1906. No. 75936 C.

Cost of Cleaning a Large Brick Sewer. Frederick L. Ford. Read before the Conn. Soc. of Engrs. Reports the cost of cleaning the Franklin avenue sewer, of Hartford, Conn. 1000 w. Munic Engng—April, 1906. No. 75935 C.

New Collector for the Sewage Purification Plant at Hamburg (Le Nouveau Collecteur et la Station d'Épuration des Eaux d'Égouts de Hambourg). Describing especially the sinking of the inverted siphon across the inner harbor. 2000 w. 1 plate. Génie Civil—March 24, 1906. No. 76214 D.

Brooklyn Sewer System. A. J. Provest, Jr. Information concerning the city's experience with vitrified clay and cement pipe. 2200 w. Munic Jour & Engr—May 2, 1906. No. 76490 C.

Concrete and Concrete Block Sewers in St. Joseph, Mo. Illustrated description of new sewers and the extension of main sewers, of plain concrete, reinforced concrete, or concrete blocks, built according to the system controlled by W. C. Parmley. 2000 w. Eng Rec—May 5, 1906. No. 76521.

Reinforced Concrete Pipe Sewers in St. Joseph, Mo. Describes the extension of sewers through land reclaimed on the Missouri River, the pipe used, and the method of laying it. 1200 w. Eng Rec—April 28, 1906. No. 76419.

The Ingersoll Run Sewer at Des Moines, Ia. A. E. Holmes. Illustrated description of the construction of a brick sewer, and of reinforced concrete sewers, explaining the requirements. 800 w. Eng Rec—May 28, 1906. No. 76417.

The Sewerage System of New Orleans. Explains the conditions and the topography of the city and gives an illustrated description of the system. 3500 w. Eng Rec—May 26, 1906. Serial. 1st part. No. 76955.

Reinforced Concrete Sewer at South Bend. Sections showing concrete forms and order of erection, with description. 1500 w. Eng Rec—June 16, 1906. No. 77339.

Some Notes on the Los Angeles Outfall Sewer. W. P. Hardesty. Describes the old and the new sewer and explains the troubles with long inverted siphons. 1600 w. Eng News—June 14, 1906. No. 77435.

Practical Sewerage. Alberto F. Schrein-er. A general description of the method of designing sewerage systems and the method of construction of sewers used in the Bureau of Sewers of the Borough of Queens, New York City. 3000 w. Trans

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## Streets

Assn of Civ Engrs of Cornell Univ—1906. No. 78038 G.

Sewers for City Drainage (Ueber Städtische Entwässerungskanäle). Dr. Krawinkel. Discussing especially the best dimensions and form of section, taking into account the questions of efficiency and cost. Two articles. 10000 w. 3 plates. *Gesundheits-Ingenieur*—July 28, Aug. 4, 1906. No. 78730, each B.

## Streets.

Street Designing. A. Prescott Folwell. Discusses the principles involved, details, width of roadway and sidewalks, requirements of railways, economy, etc. 3500 w. *Munic Jour & Engr*—June 6, 1906. No. 77193.

Adjourned Discussion on Mr. Waterhouse's Paper: "Some Observations on the Report of the Royal Commission on London Traffic, with Special Reference to the Proposed Formation of New Thoroughfares." 10500 w. *Jour Roy Inst of British Archts*—June 16, 1906. No. 77840 C.

An Important Street Improvement with Street Railway Subway at London, England. Cross-sections and description of a broad thoroughfare running north from the Strand; and of the shallow subway for double-truck cars. 2000 w. *Eng News*—July 12, 1906. No. 77927.

Street Extensions in Queens Borough, New York City. Albert H. Chandler. An account of the work of the Topographical Bureau, their methods, etc. 4200 w. *Trans Assn of Civ Engrs of Cornell Univ*—1906. No. 78039 G.

## Street Traffic.

Expert Report on San Francisco's Street Traffic Problems. An illustrated article describing the scheme outlined by

## WATER SUPPLY

## Artesian

William Barclay Parsons for the development and improvement of the city's transportation and street traffic arrangements. Also editorial. 10000 w. *St Ry Jour*—Jan. 6, 1906. No. 74227 C.

London Traffic. Captain G. S. C. Swinton. Discusses mainly the ordinary traffic of the streets and means of improving it. General Discussion. 14000 w. *Jour Soc of Arts*—March 2, 1906. No. 75491 A.

Street Traffic in New York City, 1885 and 1904. Clifford Richardson. Presents in detail data collected in 1904 on ten streets in New York City for the purpose of determining the traffic carried by a number of representative streets at that time; the results are also compared with those obtained by Francis V. Greene, in 1885. 2500 w. *Pro Am Soc of Civ Engrs*—May, 1906. No. 76932 E.

Some Observations on the Report of the Royal Commission on London Traffic. Paul Waterhouse. Especially considers the proposed formation of new thoroughfares, the difficulties, and possible solutions. Maps. Discussion. 1200 w. *Jour Roy Inst of Brit Archts*—May 26, 1906. No. 77370 C.

## Sunlight.

The Orientation of Buildings and of Streets in Relation to Sunlight. William Atkinson. A study of the subject in relation especially to hospital architecture, but applicable to residences. Ills. 5700 w. *Tech Qr*—Sept., 1905. No. 73028 E.

## Waste.

The Disposal of Municipal Waste. William F. Morse. The first of a series of articles to appear monthly. Deals with systems and methods, with special reference to American conditions. 4500 w. *Munic Jour & Engr*—Feb. 7, 1906. Serial.

# WATER SUPPLY

## Air-Lift.

On the Raising of Water by Compressed Air, at Preesall, Lancashire. James Kelly. Describes experiments carried out at works requiring 800,000 gallons of water every 24 hours. 5000 w. *Inst of Civ Engrs*—No. 3573. No. 78025 N.

## Algae.

The Prevention of the Growth of Algae in Water Supplies. Abstract of a paper by Samuel Rideal and Ronald Orchard presented at meeting of the Royal Sanitary Inst. Reviews the methods of treatment which have proved successful. 2500 w. *Eng Rec*—Sept. 8, 1906. No. 79033.

## Amsterdam.

Notes on the Improved Water Supply Works for the Amsterdam District (Mededeeling betreffende de Werken ten Behoeve van de Drinkwatervoorziening in de Stelling van Amsterdam). R. P. van Royen. Describing the complete plant for a filtered supply of ground water. 15000 w. *De Ingenieur*—Nov. 11, 1905. No. 73880 D.

## Artesian.

The Artesian System of Western Queensland. Cyrus John Richard Williams. Information concerning the water-bearing beds, the flowing and non-flowing wells, and related matter of interest. 1500



# CIVIL ENGINEERING

## Athens

w. (No. 3490.) Inst of Civ Engrs. No. 73174 N.

## Athens.

Ancient Water Supply of Athens, Greece. Describing parts of a modern waterworks which formed a part of a supply system dating back to the sixth century before the Christian era. 1000 w. Ills. Engr, Lond—March 2, 1906. No. 75511 A.

## Bore Holes.

Borehole at Malvern. An interesting account of difficulties encountered and overcome in the work of sinking boreholes to increase the water supply of this English watering place. Describes the tools used, one of which became set at a depth of 740 ft. Ills. 1500 w. Engr, Lond—Jan. 19, 1906. No. 74756 A.

## Boring.

The Deep Well and Boring at Lincoln. An account of the deepest boring in the United Kingdom, and the great find of water. Also editorial. 2500 w. Jour Gas Lgt—June 19, 1906. No. 77774 A.

## Boston.

The Water Supply of Boston. An illustrated review of the history of water supply for Boston, Mass., dating back to 1652. 2000 w. Fire & Water—July 7, 1906. No. 77800.

## Brooklyn.

Report on the Water Supply of Brooklyn Borough, New York City, for 1905. Interesting information from this report. Shows the pressing need of increasing the supply. 1200 w. Eng News—May 3, 1906. No. 76476.

## Cincinnati.

The New Cincinnati Water Works. Notes regarding these improvements, based on recent papers by George H. Benzenberg, and by E. C. Manahan. 4800 w. Eng Rec—Oct. 13, 1906. No. 79786.

Water Famine and Typhoid in Cincinnati. Ward Baldwin. An explanation of the causes of the so-called "water famine" which occurred in certain parts of Cincinnati during the week June 3, to 10 of this year. Maps. 2000 w. Eng News—July 5, 1906. No. 77819.

## Color Test.

A Delicate Color Test for Copper, and a Microchemical Test for Zinc. Harold C. Bradley. Shows the delicacy of tests made with haematoxylin in copper sulphate solutions of varying strengths, and suggests its use in testing drinking water from reservoirs treated with copper sulphates. Also a zinc test with sodium nitroprusside is described. 900 w. Am Jour of Sci—Oct., 1906. No. 79714 D.

## WATER SUPPLY

## Coolgardie.

Coolgardie Water Supply. Charles Stuart Russell Palmer. Gives briefly the history and topography of the district, with illustrated description of the design and construction of the works undertaken for the water supply of this district in Western Australia. Discussion. 65000 w. Inst of Civ Engrs (No. 3516). No. 74369 N.

## Conduits.

Cement Conduit at Cambridge, Mass. A 63-inch concrete conduit, 11,500 feet long, built in place, using steel forms and centres. The capacity, running full, is estimated at 30,000,000 per day. 1400 w. Fire and Water—March 3, 1906. No. 75344.

Toronto's Experience with Conduits. C. L. Fellowes. With a description of methods adopted in laying the 6-foot steel conduit. 2500 w. Can Soc of Civ Engrs—Jan., 1906. No. 75617 D.

A Novel Design for a Reinforced Concrete Water-Works Conduit. Gives details of a conduit recently built for a southern city. Ills. 800 w. Eng News—Oct. 4, 1906. No. 79619.

## Croton Reservoir.

Finishing Touches to the New Croton Reservoir. Gives views showing the fine effects produced by this great engineering work and interesting information in regard to it. 1200 w. Sci Am—Aug. 25, 1906. No. 78606.

## Dams.

The Belle Fourche Dam, Belle Fourche Project, South Dakota. Raymond F. Walter. One of the largest earthen dams in the United States, now being built, is illustrated and described. 2500 w. Eng Rec—March 3, 1906. No. 75408.

The Changes at the New Croton Dam. Continued discussion of paper on this subject, by Charles S. Gowen. 8500 w. Pro Am Soc of Civ Engrs—March, 1906. No. 75834 E.

The Construction of the Trap Falls Dam, Bridgeport, Conn. Illustrated detailed description of the work. 1800 w. Eng Rec—March 24, 1906. No. 75683.

The Reinforcement of the Grosbois Dam (Consolidation du Barrage de Grosbois). M. Galliot. Describing the manner in which a second dam, with intermediate auxiliary reservoir was constructed to relieve the stresses on an older structure. 5000 w. 1 plate. Ann des Ponts et Chaussées—3 Trimestre, 1905. No. 75776 E + F.

The Cross River Dam in the Croton Watershed. An illustrated description

## Dams

# CIVIL ENGINEERING

## Distilled Water

of an unusual method of construction employed on the New York water-works. 4800 w. Eng Rec—June 16, 1906. No. 77336.

See Civil Engineering, Construction.

## Distilled Water.

The Economic Production and Uses of Distilled Water. Henry Leffermann. Introductory remarks on the demand for pure water, especially in large cities, and the means of purification, the uses and advantages of distilled water, and an illustrated description of an apparatus for producing such water in quantities. Discussion. 7000 w. Pro Engrs' Club of Phila—April, 1906. No. 76938 D.

## Electrolysis.

Dr. Haber's Report on Electrolysis at Karlsruhe. A special report on the stray tramway currents at Karlsruhe, and the harm they are likely to do to the gas and water pipes. 4500 w. Jour Gas Lgt—Aug. 28, 1906. No. 79104 A.

Electrolysis of Underground Pipes. Putnam A. Bates. Gives results of tests and investigations made, stating the facts disclosed and discussing the cause and effect of stray currents and the methods of preventing and guarding against this trouble. 3800 w. R R Gaz—Aug. 31, 1906. No. 78967.

## Farm Supply.

Water Supply for Farm Buildings. An illustrated description of work and an account of how it was secured and erected. 1500 w. Met Work—Nov. 18, 1905. No. 73208.

## Filters.

The Reconstruction of the Poughkeepsie Water Filters. This was the first sand filter built in the United States. It has been completely reconstructed and covered and its new features are illustrated and described. 2800 w. Eng Rec—Dec. 2, 1905. No. 73569.

Cleaning the Old Sand Water Filters at Hudson. An account of the method of cleaning, which had to be done very economically and with a limited supply of water. 2000 w. Eng Rec—Jan. 20, 1906. No. 74500.

## Filtration.

A Modern Filter Plant. Freeland Howe, Jr. Illustrates and describes the installation of mechanical filters at Danville, Va., giving details and results. 1200 w. Munic Engng—Nov., 1905. No. 72916 C.

Report of Board of Investigating Engineers on the Philadelphia Filtration and Boulevard Contracts. Gives full report of the committee appointed to investigate

## WATER SUPPLY

all matters relating to the work on the city's new filtration plant and boulevard system. 11000 w. Eng News—Nov. 2, 1905. No. 72962.

Construction and Operative Costs of the Sand Filters of the Amsterdam Water-works (Constructie der Filters en Kosten van Zandfiltratie op het Pompstation Leidschendam der Amsterdamsche Waterleiding). Jan van Poelgeest. With full details and plans of the filters, together with construction costs and cost of operation, filtering 30,000 cubic metres of water per day. 4000 w. De Ingenieur—Jan. 27, 1906. No. 75152 D.

The American System of Filtration at Mansourah, Egypt. Edmund B. Weston. Illustrated description of this plant, erected by the Jewell Export Filter Co. 1500 w. Eng Rec—Feb. 10, 1906. No. 74972.

The Water Filtering and Softening Works at Columbus, Ohio. Illustrated description of a plant under construction, having features of interest which are an advance in works for improved water supplies. 6000 w. Eng Rec—Feb. 24, 1906. No. 75259.

Water Filtration. J. M. Smail. Deals with European methods of slow filtration, and American method of rapid, or mechanical filtration. 3200 w. Aust Min Stand—Jan. 3 and 10, 1906. Serial. 2 parts. No. 74979 each B.

Water Filtration and Purification at New Orleans. John Lewis Porter. Explains the character of the water and reviews the work formerly attempted to purify it, and the results, describing the proposed plant and method of treatment. 2500 w. Munic Jour & Engr—Feb. 7, 1906. No. 75007.

Reinforced Concrete Filter Bed Walls and Roofs, Indianapolis, Ind. William Curtis Mabee. An illustrated article describing the general design and methods of construction, and reporting cost. 3500 w. Eng News—April 26, 1906. No. 76336.

The Official Prussian Tests of the Jewell Water Filter. An account of the tests conducted by the Royal Prussian Institution and the results. 6000 w. Eng Rec—April 21, 1906. No. 76324.

The Washington Water Filtration Plant. E. D. Hardy. Gives illustrations and particulars of this plant for treating the water of the Potomac River by slow sand filtration. 1200 w. Eng Rec—April 7, 1906. No. 75982.

Filtration. J. N. Chester. Discussion of this subject with especial reference to the South Pittsburg Water Co.'s plant. Ills. 3500 w. Pro Engrs' Soc of W Penn—June, 1906. No. 77301 D.

## Filtration

# CIVIL ENGINEERING

## Fire Protection

Springfield's New Filters. Elbert E. Lockridge. Describes sand variety filters for clarifying water highly polluted with anabaena, and gives an account of the difficulties overcome. 2700 w. *Munic Jour & Engr*—July 4, 1906. No. 77805 C.

The Sand Filtration of Potable Water (La Filtration sur Sable des Eaux Potables). A. Bidault des Chaumes. A description of the Puech system of sedimentation as installed at Nanterre, Mont Valerien, for the supply of the suburbs of Paris. 2500 w. 1 plate. *Génie Civil*—May 26, 1906. No. 78117 D.

A New Slow Sand Filter for Lawrence, Mass. J. Rodney Ball. Illustrated description of a new covered slow sand filter under construction to supplement the open filter now in use. 1400 w. *Munic Engng*—Aug., 1906. No. 78362 C.

A Sand Filter for the Home. Robert Fletcher. Illustrated description of a home-made slow sand water filter, and of the care and attention required. 2200 w. *Eng News*—Aug. 9, 1906. No. 78533.

The Baiseleys, Springfield, Forest Stream, and Hempstead Filter Plants, Borough of Brooklyn, New York. Information concerning these four filter plants, the first two being mechanical filters of the gravity type, the last two consist in each case of two slow sand beds. 1500 w. *Eng News*—Aug. 23, 1906. No. 78690.

A Rapid Sand Filter Plant in Germany. Edmund B. Weston. Illustrated description of a plant recently completed at the large dyeing and bleaching works in Gera, Germany. 900 w. *Eng Rec*—Sept. 8, 1906. No. 79031.

The Life-History for Eight Years of the Experimental Coke Clinker Filter-Beds at Kingston-on-Thames. Douglas Archibald. Abridged paper. Read before the Roy. San. Inst. An account of results from the working of these beds, showing what can be done by single filtration of a high-class chemical effluent, from which solids have been eliminated. 2800 w. *Eng Rec*—Sept. 22, 1906. No. 79429.

The Life-History for Eight Years of the Experimental Coke and Clinker Filter-Beds at Kingston-on-Thames. Douglas Archibald. An interesting report of results from these beds. 4000 w. *Jour Roy San Inst*—Oct., 1906. No. 79761 D.

The Development of Mechanical Filtration. Robert E. Milligan. Illustrates and describes examples of plants and their operation. Followed by general discussion. 7000 w. *Jour W Soc of Engrs*—Oct., 1906. No. 80005 D.

## WATER SUPPLY

Works for the Purification of the Water Supply of Washington, D. C. Allen Hazen and E. D. Hardy. An account of the steps leading up to the construction of this sand filtration plant, and a description of some of the more important and novel features of its construction and operation. Ills. 15500 w. *Pro Am Soc of Civ Engrs*—Sept., 1906. No. 79532 E.

## Fire Protection.

Underwriters' Committee of Twenty on Fire Protection in New York, Chicago and Detroit. Information from recent reports, relating to the water supplies, based on thorough investigations made by experts. Also editorial. 6000 w. *Eng News*—April 26, 1906. No. 76337.

Water Supply, Fire Protection and Conflagration Hazard at San Francisco, Cal. Outlines some of the conditions prevailing in the city at the time of the disaster, and gives an abstract of the report of the Committee of Twenty of the National Board of Fire Underwriters. 3300 w. *Eng News*—April 26, 1906. No. 76341.

Subterranean Water Supply. John Richards. Read before the Engng Cong., Lewis & Clark Ex. Refers to conditions on the Pacific Coast, discussing the development of high-pressure centrifugal pumps. Ills. 2500 w. *Jour Assn of Engng Soc*—Feb., 1906. No. 76113 C.

Water Problems Concerning Fire Protection in Cities. S. H. Lockett. From a paper read at Yale University. Discusses the situation in most cities, and the systems in use, pressure, distribution systems, and related topics. 2500 w. *Munic Engng*—Oct., 1906. No. 79735 C.

## Gates.

The Balanced Gates at the Crotoy Reservoir (Vannes Equilibrées du Crotoy). M. Chevallier. Describing the installation of balanced gates of the Stoney type in the regulating reservoirs of the Somme. 2500 w. 1 plate. *Ann d Ponts et Chaussées*—I Trimestre, 1906. No. 78137 E + F.

## Ground Water.

The Flow of Water into Wells and Excavations (Ueber den Wasserzudrang in Brunnen und Baugruben). Dr. Philipp Forchheimer. An examination of the influence of pressure due to underground currents in connection with the filling of wells. 4000 w. *Zeitschr d Oesterr Ing u Arch Ver*—Oct. 27, 1905. No. 73329 D.

Preliminary Investigations of Water Supply (Ueber Voruntersuchungen für Wasserversorgungen). Dr. Philipp Forchheimer. Describing methods of

# CIVIL ENGINEERING

## High Pressure

making borings, determination of quality and quantity of flow of ground water, temperature measurements, and similar preliminary work for water-supply from wells and springs. Discussion. 4000 w. *Zeitschr d Oesterr Ing u Arch Ver*—March 30, 1906. No. 76225 D.

Underground Water Investigations in the United States. Myron L. Fuller. An explanation of the work carried on by the Division of Hydrology. 4500 w. *Ec Geol*—June, 1906. No. 78591 D.

Total Amount of Free Water in the Earth's Crust. Myron L. Fuller. Abstract from paper No. 160, U. S. Geol. Survey. Considers the total free water in rocks of various types, and underground conditions. 2000 w. *Min Rept*—Aug. 30, 1906. Serial. 1st part. No. 78942.

The Underground Water Supply of the City of Los Angeles, Cal. W. P. Hardesty. Describes some unusual methods employed in the development of the underflow supply. 3000 w. *Eng News*—May 31, 1906. No. 77037.

A Remarkable Influx of Iron and Manganese into the Underground Water Supply of Breslau, Germany. Translated by Allen Hazen, from *La Technique Sanitaire*. Reports a singular change in the mineral composition of the water, rendering it no longer usable for industrial purposes. 2800 w. *Eng News*—Oct. 4, 1906. No. 79621.

## High Pressure.

High Pressure Water Supplies for Fire Purposes. Points from a report of a committee of the National Fire Protective Assn. of special interest to water-works superintendents and engineers. 3000 w. *Munic Engng*—Jan., 1906. No. 74189 C.

## Intake.

An Old Wood Stave Water Intake at Quincy, Ill. Edward Prince. Illustrates and describes a pipe, laid in 1887, and still in perfect condition. 900 w. *Eng News*—Nov. 2, 1905. No. 72961.

## Irrigation.

An Example of Irrigation in the Arid Regions of the United States. George Frederick Vollmer. A description of a typical irrigation scheme which has been carried out by a private company called the Wyoming Development Company. Ills. 3000 w. *Inst of Civ Engrs* (No. 3553). No. 74353 N.

A Diagram to Aid the Location of Small Irrigation Canals. Paul McGeehan. Gives diagram and table that have been used for laying the grade lines on the smaller irrigating ditches of the Klamath

## WATER SUPPLY

Project of the U. S. Reclamation Service. 600 w. *Eng News*—Feb. 1, 1906. No. 74806.

The Belle Fourche Irrigation Works, South Dakota. Walter W. Patch. An illustrated account of this interesting work, including a concrete diverting dam, a large canal, a long, high earth dam, a main and lateral canal system covering 90,000 acres, and a new township. 2500 w. *Eng News*—Feb. 22, 1906. No. 75248.

A New Irrigation System. M. Alger, in *Am. Home & Garden*. Illustrated description of a system invented by Dr. August Koren, Jr., a Norwegian physician, especially adapted for gardens and small farms. 1000 w. *Sci Am Sup*—April 7, 1906. No. 75930.

The Inundation of the Salton Basin by the Colorado River and How It Was Caused. Allen Day. Describes and illustrates an inundation of great magnitude caused by work in connection with irrigation of a portion of the Colorado desert. 1700 w. *Sci Am*—April 14, 1906. No. 76037.

A Sand Trap for Irrigating Ditches. H. A. Crafts. Describes an arrangement near San José, Cal., to remove sediment from the water before it enters the ditch which irrigates the Sorosis farm. 1000 w. *Eng Rec*—Aug. 11, 1906. No. 78498.

Irrigation of Meadow and Truck Farmers in the North Atlantic States. Extracts from a report prepared by Aug. J. Bowie, Jr., and published by the U. S. Dept. of Agriculture. Gives information concerning irrigated lands and the plants for watering them. Ills. 3000 w. *Eng News*—Aug. 23, 1906. No. 78691.

Irrigation Works of the Canadian Pacific Railway, near Calgary, Alberta. An illustrated account of this great engineering work. 2500 w. *Can Engr*—Oct., 1906. No. 79759.

The Canadian Pacific Railway Company's Irrigation Project. Kittredge Wheeler. An illustrated description of the work to be carried out in Southern Alberta. 1600 w. *Sci Am*—Oct. 20, 1906. No. 79871.

The Truckee-Carson Project of the United States Reclamation Service. W. P. Hardesty. An illustrated detailed description of this great engineering project for the reclamation of about 350,000 acres of land, at an estimated cost of \$9,000,000. 12000 w. *Eng News*—Oct. 18, 1906. No. 79830.

## Lead Poisoning.

Plumbism Due to Electrolysis. Baldwin Latham. Read before the Brit. Assn. of

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## Map Symbols

W. Wks. Engs. Gives an account of a case of lead poisoning carefully investigated, and pronounced as entirely due to electrolysis. 2500 w. Elec Engr, Lond—Dec. 29, 1905. No. 74286 A.

## Map Symbols.

Representation of Wells and Springs on Maps. Myron L. Fuller. Suggestions for a system to secure uniformity. 1300 w. Eng News—Sept. 13, 1906. No. 79172.

## New York City.

Water Hazards of New York City. Presents facts tending to show the pressing need of additional supply for the city, and information concerning the additional supply proposed. Editorial. 3500 w. Eng Rec—Jan. 13, 1906. No. 74387.

Progress on Catskill Water Supply for New York City. A brief review of the first year's progress in the preliminary work of a great engineering enterprise. 1200 w. Eng Rec—Aug. 11, 1906. No. 78500.

## New York.

Report of the New York State Water Supply Commission. Extracts from the report, especially the state water supply system recommended in the report of Myron S. Falk. 2000 w. Eng News—Feb. 8, 1906. No. 74915.

## Ontario.

The Water-Works of St. Catharines. Alexander Milne. An illustrated descriptive and historical review of the supply for this city, near Niagara Falls. 2000 w. Fire & Water—July 7, 1906. No. 77802.

## Ozone.

Isolated Plants for the Sterilization of Water by Ozone (Einzelanlagen zur Sterilisation von Trink und Industrierwasser durch Ozon). Dr. G. Erlwein. Describing a convenient arrangement of the Siemens & Halske apparatus to be operated in connection with the public electric lighting circuit. Serial. Part I. 2000 w. Gesundheits-Ingenieur—Feb. 10, 1906. No. 75151 B.

Apparatus for the Sterilization of Water by Means of Ozone. Dr. Gg. Erlwein. Translated from *Gesundheit*. Illustrates and describes various outfits for ozone sterilization, adapted to different requirements. 1800 w. Sci Am Sup—April 14, 1906. No. 76038.

Contributors to the Literature of Ozone (Neues aus der Ozonliterature). A report on the sterilization of water by ozone at Wiesbaden, with a discussion by Dr. Proskauer. 3000 w, 1 plate. Gesundheits-Ingenieur—June 9, 1906. No. 77639 B.

## WATER SUPPLY

## Potability

A New Ozone Water-Sterilizing Equipment. Frank C. Perkins. Illustrated description of apparatus and methods of operation of a new system for the sterilization of water by means of ozone, electrically produced. The Siemens-Schuckert equipment. 1000 w. Elec Rev, N Y—Sept. 1, 1906. No. 78923.

## Paris.

The Water Supply from the Loing and the Lunain (Derivation des Sources du Loing et du Lunain). MM. Bechmann & Babinet. A very complete description of the aqueducts, connections and general works of the latest addition to the water supply system of Paris; giving a flow of 50,000 cubic metres per day. 30,000 w. 11 plates. Ann des Ponts et Chaussées—3 Timestre—1905. No. 75774 E+F.

## Pipe Corrosion.

Guarding Against Electrolysis of Underground Pipes. Putnam A. Bates. Gives results of recent tests made in a large town near New York, to determine the condition with regard to the presence of leakage currents from the grounded circuit of the local traction company. 2000 w. Elec Rev, N Y—Nov. 11, 1905. No. 73114.

See Street and Electric Railways.

## Pipe Joints.

Socket Joints for Cast-Iron Pipes (Gusseiserne Muffenrohrverbindungen). Gustav Simon. An illustrated study of the proportions of the bell or socket connections used in Germany for water and gas pipe of cast-iron. 2500 w. Stahl u Eisen—Feb. 1, 1906. No. 75136 D.

## Pipe Line.

The Pipe Line of the New Gravity Water Supply of Lynchburg, Va. Illustrated description of a pipe line 30 in. in interior diameter and about 110000 ft. long, consisting of 99000 ft. of wood stave pipe, 7000 ft. of lock-bar steel pipe, and 4000 ft. of cast-iron pipe. 3000 w. Eng Rec—Sept. 1, 1906. No. 78924.

## Pollution.

Report on Possible Pollution of the Water Supply of Seattle by a Proposed Railway Throughout the Drainage Area. 1800 w. Eng News—Aug. 30, 1906. No. 78903.

## Potability.

The Relation of Sedimentation and Acid Mine Wastes to the Potability of the Lower Monongahela River. S. J. Lewis. Does not consider the sedimentation adequate for the removal of impurities. Also discusses the germicidal effect of acid mine wastes on pathogenic

## CIVIL ENGINEERING

### Pumping

germs. 3000 w. *Eng News*—March 15, 1906. No. 75529.

### Pumping.

The Growth of the Pumping Station. Charles A. Hague. Read before the Am. Water-Works Assn. A review of the growth and development of pumping stations, and the tendency for future construction and operation. 7000 w. *Eng Rec*—July 14, 1906. No. 77940.

High-Pressure Gas Power Pumping System. Illustrated description of a special system for fire protection at Coney Island, N. Y. 1300 w. *Engr. U S A*—Oct. 1, 1906. No. 79598 C.

Water-Pumping Installation for Burma. Illustration and brief description of an interesting plant for the oil-fields. It is one of the largest vertical direct-acting single-pumping plants yet constructed. 400 w. *Engng*—Sept. 21, 1906. No. 79585 A.

Electric Pumping at Schenectady, N. Y. G. S. Hook. An illustrated description of this plant, now in continuous operation. 1600 w. *Jour N Eng W-Wks Assn*—March, 1906. No. 75567 F.

### Pumping Plant.

The Turbine Pumping Plant of the Buffalo Water Works. An account of extensive improvements, including the installation of eight 25,000,000-gal. vertical two-stage turbine pumps, each connected to an electric motor. 1300 w. *Eng Rec*—Oct. 28, 1905. No. 72908.

### Pumping Station.

The District Pumping Station at Washington. W. A. McFarland. Illustrated description of the building and the present pumping equipment. 1800 w. *Eng Rec*—Jan. 20, 1906. No. 74499.

The Pumping Station at Messein for the Supply of the City of Nancy (*Usine Elevatoire de Messein pour l'Alimentation de la Ville de Nancy*). A. M. J. Mauduit. An illustrated description of the station on the Moselle, using centrifugal pumps driven by electric motors. The motive power is derived from the river. 3000 w. *Génie Civil*—March 31, 1906. No. 76217 D.

### Pumps.

See Mechanical Engineering, Hydraulics.

### Pure Water.

Life or Death in Pure Country Drinking Water. George Ethelbert Walsh. Shows the dangers found in wells and most water supplies in the country, and considers the best way to secure a safe supply. 2500 w. *Archts & Builds' Mag*—June, 1906. No. 77178 C.

### WATER SUPPLY

### Purification

The Value of Pure Water. George C. Whipple. A study of different characteristics of water and what they cost the consumer, and of the prices consumers are willing to pay to avoid using waters which possess certain characteristics. 4500 w. *Eng Rec*—Sept. 8, 1906. Serial. 1st part. No. 79036.

### Purification.

Experiments with Copper-Iron Sulphate for Water Purification at Marietta, Ohio. Describes the water-works and the filtration, sedimentation and purification plants. The supply is drawn from the Ohio River. 3000 w. *Eng Rec*—March 24, 1906. No. 75684.

Device for Cleansing Stored Water. Illustrates and describes a system, devised by Timothy Lydon, for draining sediment in reservoirs and tanks. 1000 w. *Fire & Water*—May 12, 1906. No. 76623.

New Water Purification Plant at Paris, Ky. Robert Spurr Weston. Describes a plant consisting of a coagulating basin, aerators, four rapid filters, and a clear water basin, which possesses original features of design. Ills. 2000 w. *Eng News*—May 3, 1906. No. 76475.

The Purification of Drinking Water in Large Volumes (*Reinigung des Wassers in Grösseren Mengen*). A. Oelwein. Advocating the use of alum as a coagulant, followed by mechanical filtration. 4000 w. *Zeitschr d Oesterr Ing u Arch Ver*—April 13, 1906. No. 76820 D.

Disinfection as a Means of Water Purification. George C. Whipple. Read before the Am. Water-Wks. Assn. Calls attention to the need of more thorough study of this subject, and describes the water-works of Ostende and Middelkerke, Belgium, where chlorine is used as a disinfecting adjunct to filtration. 4000 w. *Eng Rec*—July 28, 1906. No. 78274.

Sulphate of Iron and Caustic Lime as Coagulants in Water Purification. Joseph W. Ellms. Read at meeting of Central States Water-Works Assn. Discusses the objections to their use and the advantages, giving the cost of this process. 3500 w. *Eng News*—Oct. 4, 1906. No. 79625.

Sulphate of Iron and Caustic Lime as a Coagulant in Water Sedimentation. W. A. Patton. Read before the Central States Water-Works Assn. Gives a report of the writer's experience at plants in Kentucky and West Virginia. 2000 w. *Eng News*—Oct. 4, 1906. No. 79626.

The Use of Copper Sulphate in the Purification of Water. Leo F. Rettger, and H. B. Endicott. Reports the results of a study of the action of copper sul-

# CIVIL ENGINEERING

## Rates

phate on a number of micro-organisms. 1400 w. Eng News—Oct. 25, 1906. No. 80090.

## Rates.

The Principles Governing the Valuation for Rate-Fixing Purposes of Water Works Under Private Ownership. Arthur L. Adams. Read before the Engng. Cong., Lewis & Clark Ex. Considers in detail the fundamental factors influencing value. 7500 w. Jour Assn of Engng Socs—Feb., 1906. No. 76114 C.

## Reclamation.

The United States Reclamation Service. An explanation of the methods of carrying on the work of irrigation in the western part of the United States. 2300 w. Engr, Lond—July 6, 1906. No. 77988 A.

## Reconstruction.

The Reconstruction of the Ottumwa, Ia., Water Works. A new pumping station and other improvements are illustrated and described, and the general plan of the system outlined. 2000 w. Eng Rec—March 31, 1906. No. 75885.

## Regulation.

Regulations Governing the Submission of Water Supply Projects for the Approval of the Prussian Government. Translated by William Paul Gerhard. A copy of a circular published by the Prussian Minister for Education and Sanitary Matters. 2200 w. Eng News—July 19, 1906. No. 78066.

Regulations of the Engineering Bureau, Board of Water Supply, New York. Gives some of the regulations prepared to insure uniform and correct methods. 3500 w. Eng Rec—Sept. 29, 1906. No. 79559.

## Regulators.

Water Pressure Regulators. A. O. Doane. Brief illustrated descriptions of various makes of regulators for equalizing the pressure in different parts of a distributing system. General discussion 5000 w. Jour N Eng W-Wks Assn—March, 1906. No. 75564 F.

The Automatic Regulation of Flow of Water Plugs and Faucets (La Limitation Automatique du Debit dans les Bornes-Fontaines et Robinets). P. A. Bergès. A description of the various devices for public water supply so arranged as to prevent waste and limit the flow to the actual requirements. Series, Part I. Génie Civil—Feb. 17, 1906. No. 75712 D.

## Reservoirs.

Sheet Steel Piles in Reservoir Construction. Describes a reservoir near New Milford, New Jersey, explaining the conditions. Ills. 1200 w. Eng Rec—Nov. 18, 1905. No. 73250.

## WATER SUPPLY

## Reservoirs

The East Canyon Creek Reservoir, Morgan Co., Utah. William M. Bostaph. A brief history of this irrigation enterprise and an illustrated description of the work. 3200 w. Eng Rec—Nov. 25, 1905. No. 73495.

The Construction of a Reinforced Concrete Reservoir at Fort Meade, South Dakota. Samuel H. Lea. Gives a brief description of the locality, and the conditions requiring the construction, and the new pipe line, with details of the reservoir and its construction. Ills. 7400 w. Eng News—Dec. 28, 1905. No. 74031.

Note on the Underpinning of the Piers in the Reservoirs of the Galatz Waterworks, Roumania. William Morris Langford. Illustrates and describes the manner of supporting the piers and their loads during repairs. 5000 w. Inst of Civ Engrs (No. 3551). No. 74352 N.

Reinforced-Concrete Reservoir at Fort Meade. Illustrated description of a 500,000 gal. reservoir with a flat slab roof carried by beams and girders supported on square reinforced-concrete columns. 1800 w. Eng Rec—Feb. 10, 1906. No. 74974.

A Reinforced Concrete Reservoir at Bloomington, Ill. The method of construction is illustrated and described. 3500 w. Eng Rec—March 3, 1906. No. 75401.

Reservoir at Ft. Meade, S. D. S. H. Rea. Illustrated description of a recently completed reservoir constructed of reinforced-concrete. 2800 w. Munic Engng April, 1906. No. 75934 C.

Construction Work on the Charles River Dam and Basin at Boston, Mass. J. Albert Holmes. Illustrates and describes bridge work, the coffer dams, and the Boston marginal sewer. 3500 w. Eng News—March 1, 1906. No. 75306.

The Construction of the Charles River Dam and Basin at Boston. John N. Ferguson. The completion of a temporary highway bridge and approaches, completion of the Boston coffer dam, dredging and pile driving, etc., are illustrated and described. 4500 w. Eng Rec—March 3, 1906. No. 75406.

The Hagerstown Reservoir. J. W. Ledoux. Explains the conditions to be met, and illustrates and describes the storage reservoir finally built. 1600 w. Eng Rec—March 3, 1906. No. 75386.

Concreting the Jerome Park Reservoir. Brief illustrated account of the methods used in carrying out this extensive work. 1300 w. Sci Am—May 12, 1906. No. 76628.

The Development and Practical Construction of Valley Reservoirs (Die Ge-

# CIVIL ENGINEERING

## Siphons

schichtliche Entwicklung, die Zwecke und der Bau der Talsperren). Dr. O. Intzé. A posthumous paper of the late Dr. Intzé giving an exhaustive review of experiences in the construction of artificial storage reservoirs by building masonry dams across valley outlets. Serial. Part I. 7000 w. Zeitschr d Ver Deutscher Ing—May 5, 1906. No. 76805 D.

The Emptying of Systems of Reservoirs (Le Vidage des Systèmes de Réservoirs). Edmond Maillet. A mathematical study of the time required to empty reservoirs situated at various levels and with communicating pipes in different positions. Formulas are derived for the more general cases. 9000 w. Ann d Ponts et Chaussées—1 Trimestre, 1906. No. 78131 E + F.

## Siphona.

Experimental Results with Siphon Connections (Ueber Erfahrungen mit Heberleitungen). H. Metzger. A description of the water supply of the city of Bromberg, in Prussia, the water being taken from a number of wells through mains forming several siphons to the pumping station. 5000 w. Gesundheits-Ingenieur—March 10, 1906. No. 75754 D.

## South Africa.

Additional Water Supply for Johannesburg, South Africa. Explains a scheme for obtaining an additional daily supply of 8,000,000 gallons. 2000 w. Eng News—Aug. 2, 1906. No. 78395.

Port Elizabeth New Water Scheme. An illustrated article giving particulars of an important water scheme in South Africa, which is estimated to cost £360,000. It includes a dam and a new road on the Sand River, a dam tram line and new road in the Bulk River Valley, the pipe line, a tunnel, and a service reservoir. 2000 w. Engr, Lond—Jan. 19, 1906. No. 74755 A.

## Springs.

The Hot and Mineral Springs of Routt County and Middle Park, Colorado. A. Lakes. An illustrated description of interesting and valuable springs, which will probably become very important in the future. 1200 w. Min Rept—Nov. 2, 1905. No. 73041.

The Scherrer Method of Impounding Mineral Springs (Die A. Scherrersche Mineralquellen - Fassungs-methode). F. Müller. A review of methods of collecting any one of several sources of underground water, showing the practicability of capping the veins of water in the rock. 4000 w. Zeitschr d Oesterr Ing u Arch Ver—Nov. 3, 1905. No. 73330 D.

## WATER SUPPLY

## Supplies

The Impounding of Springs (Captage des Sources). M. Lidy. Discussing the enclosing of springs or other ground water supplies to prevent contamination from local or surface drainage, with especial reference to the water supply of Brest, France. 2000 w. Ann d Ponts d Chaussées—2 Trimestre, 1906. No. 79333 E + F.

Causes of the Diminution in the Fl-w of Springs (La Cause de l'Appauvrissement des Sources). M. Houllier. A review of observations made in the valley of the Somme, showing that intensive cultivation of the soil is abstracting an increasing proportion of moisture. 2500 w. Revue Technique—Nov. 25, 1905. No. 73840 D.

## Standpipe.

A Large Reinforced Concrete Standpipe. A standpipe 50 ft. in diameter, 106 ft. high, with a capacity of 1,500,000 gals. recently put in service at Attleboro, Mass., is illustrated and described. 5500 w. Eng Rec—Sept. 29, 1906. No. 79554.

## Stave Pipe.

Additional Information on the Durability of Wooden Stave Pipe. Arthur L. Adams. Facts concerning the pipe line at Astoria, Ore., which has proven deficient in durability. 1000 w. Pro Am Soc of Civ Engrs—Sept., 1906. No. 79531 E.

## Sterilization.

Water Sterilization. Dr. Alfred Gradenwitz. Illustrated description of a sterilizing apparatus, showing several types and the variety of applications. 1500 w. Sci Am—June 2, 1906. No. 77051.

## Stray Currents.

Electrolysis. A topical discussion with illustrations of the corrosion of pipes by stray electric currents. 6000 w. Jour N Eng W. Wks Assn—March, 1906. No. 75565 F.

Electrolysis: General Electrical and Lightning Protection. H. W. Spang. Describes the damage caused to water and gas pipes and other underground metal structures, explaining the causes. 2700 w. Am Gas Lgt Jour—May 7, 1906. No. 76505.

## Supplies.

Rural Water Supplies. J. Mitchell Wilson. Read before the Brit. Assn. of W.-Wks. Engrs. Discusses sources of supply for the rural districts of England. 4500 w. Jour Gas Lgt—July 24, 1906. No. 78376 A.

Water Supply in a Dairy District. William Phelps. The needs in these districts in England are considered, the charges for water, the control of sources



## CIVIL ENGINEERING

### Tanks

of supply, etc. Maps. 3800 w. Jour Gas Lgt—July 24, 1906. No. 78377 A.

Carlisle's New Water-Works. Illustrated description of this British system which utilizes springs and streams which form the headwaters of the river Gelt. 2000 w. Engr, Lond—Aug. 24, 1906. No. 79017 A.

Progress on the Catskill Mountain Water Supply for New York City. Outlines the proposed works for providing by gravity an additional supply for New York City, and the preliminary work already completed. Ills. 3500 w. Eng Rec—Oct. 13, 1906. No. 79783.

The New Water Supply of Franklin, N. H. Information regarding improvements, taken from the report of F. L. Fuller. 2200 w. Eng Rec—Oct. 27, 1906. No. 80113.

### Tanks.

The Stresses in the Horizontal Girder of an Elevated Tank. C. E. Day. Gives a study made by the writer of the stresses in a horizontal girder of a tank for a water supply system. 700 w. Eng Rec—June 9, 1906. No. 77238.

### Treatment.

The Treatment of Water with Copper Sulphate at Denver, Colo. George T. Prince. Gives results of the treatment of a small lake at City Park, and also the treatment of Marston Lake reservoir. Ills. 500 w. Eng News—Nov. 30, 1905. No. 73550.

### Typhoid.

On the Present Relative Responsibility of Public Water Supplies and Other Factors for the Causation of Typhoid Fever. W. T. Sedgwick and C. E. A. Winslow. A discussion of the cause of this disease and the necessary steps to overcome it. The remedy is absolute and universal cleanliness. General discussion. 13000 w. Jour N Eng W. Wks Assn—March, 1906. No. 75566 F.

### Waste.

The Business View of Water Waste. Editorial showing that frequently the prevention would cost more than the waste, and that each problem must be studied separately. 1200 w. Eng Rec—March 31, 1906. No. 75880.

Report on Water Waste in New York and Its Reduction by Meters and Inspection. Information taken from a re-

### WATERWAYS AND HARBORS

### Atchafalaya River

port by Jas. H. Fuertes, giving the conclusions reached. 2000 w. Eng News—Aug. 9, 1906. No. 78537.

### Water Softening.

Practical Water Softening for Municipalities. C. Herschel Koyl. Considers methods of improving the supply for drinking and industrial uses. 2500 w. Munic Jour & Engr—April 4, 1906. No. 75942 C.

### Water Meters.

See Civil Engineering, Measurement.

### Water Tower.

See Civil Engineering, Construction.

### Water Works.

The New Water-Works and Reinforced Concrete Conduits of the City of Mexico. James D. Schuyler. Illustrations and brief description of a system for supplying pure spring water under ample pressure. 1200 w. Eng News—April 19, 1906. No. 76129.

The New Water Works of Port Elizabeth, Cape of Good Hope. Illustrations and general information concerning important works in course of construction in South Africa. 1100 w. Eng Rec—Feb. 3, 1906. No. 74862.

### Wells.

Water Supply and the Driving of Wells. John Sanford. An illustrated article on this work in connection with the development of farm plumbing work. 3500 w. Met Work—Dec. 30, 1905. No. 74086.

Strainers for Driven Wells. Dabney H. Maury. Considers driven wells, and the fine and coarse strainers, reviewing the advances in strainer construction. Eng News—March 8, 1906. No. 75436.

### Well Drilling.

The Work of Well-Drilling Machines on the Pennsylvania R.R. Low Grade Freight Line. W. R. Hulbert. An illustrated article describing the work done by these machines and the results attained. 1500 w. Eng News—April 12, 1906. No. 76051.

### Wisconsin.

The Sources of Water Supply in Wisconsin. William Gray Kirchoffer. Describes the sources of both surface and ground waters from which cities and villages are supplied. Illus. 21000 w. Bul Univ of Wis, No. 106—Jan., 1906. No. 75297 E.

## WATERWAYS AND HARBORS

### Atchafalaya River.

The Atchafalaya River: Some of Its Peculiar Physical Characteristics. J. A.

Ockerson. An illustrated general description of an unusual stream, which is largest at its source and deepest in places

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## Antwerp

## WATERWAYS AND HARBORS

## Canal Lifts

of excessive width. Gives statistics of levee construction. 3500 w. *Pro Am Soc of Civ Engrs*—Sept., 1906. No. 79534 E.

## Antwerp.

Extension of the Port of Antwerp. An account of the proposed enlargement of the port, showing plan that will make it one of the most commodious ports in the world. 2000 w. *Engr, Lond*—April 13, 1906. No. 76307 A.

The Improvements at the Port of Antwerp (*Les Nouveaux Agrandissements du Port d'Anvers*). A description, with map of the plans for the enlargement of the port of Antwerp, including the straightening of the channel of the Scheldt, and the extensive new docks. 1800 w. *Génie Civil*—March 17, 1906. No. 76213 D.

## Bank Protection.

Mattress Revetments On the Mississippi River. Harry N. Howe. Describes the construction of the mattress and its placing and loading. Ills. 1000 w. *Eng Rec*—Aug. 18, 1906. No. 78639.

## Barcelona.

Extension Works at the Port of Barcelona (*Les Agrandissements du Port de Barcelone*). François Audion. Describing the extension of the breakwater and the plans for new quays and basins. 3500 w. 1 plate. *Génie Civil*—May 5, 1906. No. 77610 D.

## Bohemia.

The Construction of the Lateral Canal from Wranan to Horin (*Der Bau des Lateralkanales von Wranan nach Horin*). W. Rubin. With illustrations of the construction work on a waterway 10 kilometres long by the Moldau in Bohemia, with details of the locks for a fall of 9 metres. 4000 w. 1 plate. *Zeitschr d Oesterr Ing u Arch Ver*—March 30, 1906. No. 76224 D.

## Breakwaters.

A Curious Engineering Analogy in Connection with the Design of the Cleveland Breakwater. Gives report and drawing of a design made in 1877 showing its similarity to types recently built at Buffalo and Cleveland. 1200 w. *Eng News*—March 15, 1906. No. 75530.

The Sandy Bay Breakwater, National Harbor of Refuge, Cape Ann, Mass. Describes a breakwater which will rank as the most extensive structure of its kind in the United States, so far as depth of water, size and cost are concerned. Ills. 3000 w. *Eng News*—March 8, 1906. No. 75435.

## California.

Harbor Improvement at San Pedro and Wilmington, California. Map and

illustrated descriptions of work in progress for creating safe harbors at these points. 3000 w. *Eng News*—Aug. 16, 1906. No. 78581.

## Canals.

An Underflow Canal Used for Irrigation at Ogalalla, Nebraska. Charles S. Slichter. Describes one of the most successful underflow canals, discussing the causes of failure of this method of irrigation. Ills. 2200 w. *Eng News*—July 5, 1906. No. 77817.

On Waterways in Great Britain. John Arthur Saner. Considers the present condition of the waterways and the measures necessary for their improvement. Tabulated information is given in appendixes, also discussion. Maps. 5000 w. *Inst of Civ Engrs*, No. 3593—Nov. 14, 1905. No. 78017 N.

The Bridgewater Canal Navigations. Walter Hartley Wiswall. Information concerning this 40 mile canal in England. 700 w. (No. 3504.) *Inst of Civ Engrs*. No. 73163 N.

Canals Ancient and Modern. This first article of the series reviews the ancient history of the canals of various countries. 2000 w. *Engr, Lond*—Jan. 12, 1906. Serial. 1st part. No. 74528 A.

The Sault Ste. Marie Canals. Map and description of the two canals at Sault Ste. Marie. 1800 w. *R R Gaz*—June 8, 1906. No. 77232.

The Teltow Canal (*Der Teltowkanal*). Chr. Havestadt. This recently opened waterway connects the Spree with the Havel, passing near Potsdam, Spandau, and Charlottenburg, this rendering it of much commercial importance. Electric traction is used, and details of this, and of the locks and bridges, are given. Two articles. 7000 w. *Zeitschr d Ver Deutscher Ing*—June 2, 9, 1906. No. 77603 each D.

See also *Industrial Economy*.

## Canal Haulage.

Electric Canal Haulage. Frank C. Perkins. An illustrated description of an equipment on trial in Germany, with short accounts of other systems. 1500 w. *Ir Age*—Feb. 15, 1906. No. 75001.

## Canal Lifts.

Helicoidal Canal Lift (*Ascenseur pour Bateaux, à Mouvement Hélicoidal*). Ch. Dantin. A description of the Oelhafen-Löhle system for raising canal boats from a lower to a higher level. 1500 w. *Génie Civil*—Feb. 17, 1906. No. 75713 D.

Lift Tanks on Rollers Ueber Trogschleusen auf Walzen). Fr. Jebens. Describing an improved form of roller

# CIVIL ENGINEERING

## Canal Traction

## WATERWAYS AND HARBORS

## Cranes

track bearings for tanks to be used on inclined plains for canal lifts. 2000 w. Glaser's Annalen—March 1, 1906. No. 75723 D.

Trent-Valley Canal Hydraulic Lift-Lock. J. J. Bell. Information and illustrated detailed description of the hydraulic lift-lock at Peterborough, Ontario. 3500 w. Engng—March 16, 1906. No. 75805 A.

Elevators for Canal Boats (Ueber Schiffshebewerke). Dr. A. Riedler. A comparison of the inclined plane and the revolving drum design as submitted in the competition for the Danube-Oder canal, at Prerau. Serial, Part I. 3500 w. Zeitschr d Oesterr Ing u Arch Ver—July 13, 1906. No. 78160 D.

### Canal Traction.

The American Canal Towing System of Wood and the Double-Rail Locomotive System (Das Amerikanische Schleppschiffahrts System Wood und das Zweigleisige Lokomotiv System). C. Köttingen. A comparison of the single I-beam system with the electric trolley system on the Teltow canal. 4000 w. Elektrotech Zeitschr—Aug. 9, 1906. No. 79347 B.

The Teltow Canal and Its Equipment. Based on articles which have appeared in the *Elektrotechnische Zeitschrift*. Begins an illustrated description of this German Canal. Also editorial. 3300 w. Elect'n, Lond—Sept. 14, 1906. Serial. 1st part. No. 79454 A.

The Traction Equipment of the Teltow Canal (Die Betriebseinrichtung des Teltowkanals). Erich Block. An exhaustive description of the electric plant designed for the operation of electric traction on the canal connecting the Spree with the Havel. Serial. Part 1. 4000 w. Elektrotech Zeitschr—May 31, 1906. No. 77649 B.

Electric Operation of the Teltow Canal. Frank C. Perkins. Illustrated description of the system in use on this important German waterway. 2200 w. Elec Rev, N Y—Sept. 29, 1906. No. 79542.

Electric Traction on the Teltow Canal near Berlin (Le Halage Electrique des Bateaux sur le Canal de Teltow pres de Berlin). F. Hofer. With photographs of the electric hauling car and electric tow boat, and general plan of the canal and locks. 3000 w. 1 plate. Génie Civil—Oct. 6, 1906. No. 79912 D.

The Teltow Canal. An illustrated description of this recently completed artificial waterway, one of the largest ever constructed. 1600 w. Sci Am—Oct. 13, 1906. No. 79755.

### Channels.

The Buoying and Lighting of Navigable Channels. Brysson Cunningham. An illustrated article discussing the essential features of any satisfactory system with especial reference to English practice, but giving also the regulations of other countries. 4000 w. Engng—April 6, 1906. Serial. 1st part. No. 76078 A.

### Coasts.

Coast Erosion and Reclamation. Describes the physical causes at work, the present condition of the portions most seriously attacked, and the possibilities of remunerative protection. 3500 w. Engr, Lond—April 27, 1906. Serial. 1st part. No. 76578 A.

### Coast Canal.

To Connect the Rio Grande and the Mississippi. C. S. E. Holland. Map and description of the proposed intercoastal canal connecting the Mississippi River and its tributaries with the coast region of Louisiana and Texas to the mouth of the Rio Grande. 900 w. Mfrs Rec—May 3, 1906. No. 76481.

### Coast Erosion.

I. Coast Erosion. Alfred Edward Carey. (No. 3493.) II. Erosion on the Holderness Coast of Yorkshire. Ernest Romney Matthews. (No. 3495.) With an abstract of the discussion on the two papers. In the first paper the author considers from an administrative rather than from an engineering standpoint, the measures to be adopted for defence against such encroachment. The second paper describes the remedial works executed or suggested. Ills. 5400 w. Inst of Civ Engrs. No. 73154 N.

### Colorado River.

The Break of the Colorado River into the Imperial Valley and Salton Sink. An account of the flood and damage caused by cutting a short emergency irrigation canal from the lower Colorado River. Map. 3500 w. Eng News—Feb. 22, 1906. No. 75249.

### Conveyors.

See Mechanical Engineering, Power and Transmission.

### Cranes.

100-Ton Electric Wharf crane, Dublin Harbor. Illustration, with short description. 500 w. Engng—Jan. 19, 1906. No. 74747 A.

Floating Crane of 25 Tons Capacity (Schwimmkran von 25 t. Tragkraft). R. Dub. Illustrating a powerful floating steam crane built by Petravic of Vienna, for the Austrian Lloyds at the port of Trieste. 2000 w. Zeitschr d Ver Deutscher Ing—Sept. 1, 1906. No. 79309 D.

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## Dams

Counterbalanced Dock Crane of 150 Tons Capacity (Hammerwippkran für 150 t. Grösste Last). A. Böttcher. Illustrating the construction of a powerful radial crane of variable radius, arranged to stand at the edge of the dock wall; constructed by the Duisburg Machine Works. Complete structural details are given. Serial. Part 1. 4000 w. Zeitschr d Ver Deutscher Ing—Oct. 6, 1906. No. 79905 D.

140-Ton Floating Crane. Illustrated detailed description of this appliance and its operation. 1800 w. Engr, Lond—Sept. 21, 1906. No. 79592 A.

## Dams.

See Civil Engineering, Construction.

## Danube.

Improvements in the Navigation of the Bavarian Danube (Die Verbesserung der Schiffbarkeit der Bayerischen Donau). With map and profile, showing the canalisation works now in progress on the Danube from Saal to Ulm. 1500 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Jan. 20, 1906. No. 75131 D.

## Defence-Works.

Sea-Coast Defence-Works in the Netherlands. Harco Theodorus Hora Siccama. Illustrates and describes some of the methods employed to protect the coast from erosion. 4000 w. Inst of Civ Engrs—No. 3590. No. 79516 N.

Sea Defences in Ferro-Concrete. Short illustrated description of a method of protection of embankments adopted in Zeeland, Holland. 700 w. Engng—Oct. 19, 1906. No. 80139 A.

## Docks.

The Graving Docks of Hong Kong. Albert Denison. Short descriptions of the docks built and under construction. 1000 w. (No. 3492.) Inst of Civ Engrs. No. 73166 N.

The New Bombay Docks. Information concerning the work in progress for increasing the dock facilities, and some of the difficulties to be overcome. 2500 w. Engr, Lond—Nov. 10, 1905. No. 73293 A.

The New Dock of the French Transatlantic Line at Havre (La Nouvelle Gare Maritime de la Compagnie Générale Transatlantique au Havre). A. Dumas. A fully illustrated description of the new terminal docks of the French Transatlantic line; showing the great convenience to the passengers. 2500 w. 1 plate. Génie Civil—Sept. 22, 1906. No. 79909 D.

Ore Dock Improvements at Ashtabula. Plan and description of the large modern ore unloading dock being erected at this

## WATERWAYS AND HARBORS

## Drainage

Lake Erie port. 1300 w. Ir Trd Rev—Sept. 29, 1906. No. 79278.

The Stuyvesant Docks of the Illinois Central R. R. at New Orleans. A modern tidewater freight terminal, occupying a 90-acre site, with a frontage of about a mile on the left bank of the Mississippi River, is illustrated and described. 5000 w. Eng Rec—June 23, 1906. No. 77431.

Lowering the Sill of the Great Central Railway Union Dock, Grimsby. An illustrated description of the methods adopted, which allowed shipping to pass in and out of the dock. 2000 w. Engng—July 20, 1906. No. 78311 A.

The Chalmette Docks of the New Orleans Terminal Co. Illustrated description of this immense deep-water railroad and ship terminal on the Mississippi River at New Orleans. 5000 w. Eng Rec—July 28, 1906. Serial. 1st part. Also editorial. No. 78272.

## Dock Crane.

A One-Hundred-Ton Derrick Crane for Fitting out Vessels. Illustration, with description, of an interesting crane in use in a Scotch shipyard. 1000 w. Sci Am—June 23, 1906. No. 77420.

## Dover.

Dover Harbor Extension. Remarks on the magnitude of the work and its difficulties. 1200 w. Engr, Lond—Aug. 10, 1906. No. 78680 A.

## Drainage.

Drainage of Tidal and Swamp Lands in South Carolina. Extracts from a paper by Elwood Mead discussing the coastal plain and river lands and the work needed for their improvement. 1500 w. Eng News—Aug. 23, 1906. No. 78689.

Marsh Reclamation as a Preventive of Mosquito Generation—Commercial Uses of Reclaimed Marshes. An illustrated article discussing the work in progress on the coasts of New Jersey and New York, and describing some uses made of the salt meadows. 1200 w. Sci Am Sup—Aug. 18, 1906. No. 78627.

The Assessment of Drainage Districts. L. E. Ashbaugh. Suggests certain principles which may govern the distribution of expenses over the various tracts, and gives an arithmetical method for the solution of the problem. Discussion. 7300 w. Jour W Soc of Engrs—Aug., 1906. No. 78893 D.

The Drainage of the Florida Everglades. S. L. Lupfer. An interesting account of the difficulties met in surveying the Everglades, discussing the question of canal routes, and describing the

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## Dredges

dredges to be used. 4000 w. Eng News—April 5, 1906. No. 75947.

## Dredges.

Experience with the U. S. Dredges "Manhattan" and "Atlantic," Employed upon Ambrose Channel, New York Harbor. Henry N. Babcock. A report giving a general description of the dredges, the character of the material dredged, data concerning the work, alterations, repairs, costs, etc. Ills. 6500 w. Eng News—Sept. 29, 1906. No. 79285.

The Sea Going Bucket Dredge, Fedor Solodoff (Der Seetuchtige Eimerbagger Fedor Solodoff). A. v. Overbeeke. Illustrated description of a ladder bucket dredge, with suction and discharge pipes for use in the sea of Azov, at the mouths of the Danube and the Don. 1500 w. 1 plate. Zeitschr d Ver Deutscher Ing—April 7, 1906. No. 76204 D.

Russian Dredgers. A. Bormann. Read before the Milan Congress. Illustrated descriptions of dredges built entirely in Russia, by Russian firms. 4000 w. Naut Gaz—Jan. 11, 1906. No. 74365.

## Dredger.

New Dredger for the Clyde. A new and very powerful barge-loading bucket dredger is illustrated and described. 800 w. Engr, Lond—April 27, 1906. No. 76581 A.

Submerged Chain Cable Groynes. R. G. Allanson-Winn. Discusses the force at work along the coasts, especially deep-sea erosion, and the method of protecting the land by the use of the chain cable groyne. 9 plates. 7000 w. Soc of Engrs—March 5, 1906. No. 77009 N.

## Dredging.

The Cost of Deep-Water Dredging with a Clam-Shell Dredge for the Stony Point Extension of the Buffalo, N. Y., Breakwater. Emile Low. Explains the conditions and the work and gives an estimate of the cost of dredging. 1000 w. Eng News—Oct. 11, 1906. No. 79721.

The Work of a Ladder Dredge and Belt Conveyor System on the Fox River, Wisconsin. L. M. Mann. States the requirements of the work, and gives an illustrated description of the conveyor dredge which fulfilled the conditions. 1800 w. Eng News—Oct. 25, 1906. No. 80089.

Dredging and Dredging Appliances. Brysson Cunningham. The present article illustrates and describes types of dipper and ladder dredges. A concluding article will be devoted to grab and hydraulic dredges. 2500 w. Cassier's Mag—Nov., 1905. Serial. 1st part. No. 72990 B.

## WATERWAYS AND HARBORS

## Euphrates

Government Dredge for Delaware River. Illustrated detailed description. 1200 w. Marine Engng—Nov., 1905. No. 72914 C.

A New Dredging Vessel for India. Illustrated description of the suction-pump canal embanking dredger Foyers, built for the government of India. 800 w. Marine Rev—July 12, 1906. No. 77952.

Dredging Plant for India. Illustrated detailed description of a large and notable dredging vessel for special work in the Bengal Presidency. It is a suction-pump, triple-screw, canal embankment dredger designed especially for opening new waterways, and improving shallow canals and rivers. 1200 w. Engr, Lond—July 13, 1906. No. 78222 A.

## Dry Dock.

The Charlestown Dry Dock Motor Pumping Plant. Graham Smith. Illustrated description of the electrically-driven pumping plant by which this new dock in the Boston Navy Yard is operated and emptied. 500 w. Elec Wld—Aug. 18, 1906. No. 78658.

## Embankments.

The Feuerlöscher System of Concrete Cylinder Construction (Die Betonsenkwalze nach der Bauweise Feuerlöscher). Fritz Hromatka. Describing a method of moulding concrete into cylindrical masses for use in submerged river-embankments construction. 1500 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—Feb. 17, 1906. No. 75763 D.

## Emden.

The Harbor Plant at Emden (Die Emdener Hafenanlage). E. Leber. An account of the cranes, cantilevers, conveyors and other mechanical appliances recently installed for the handling of coal and iron at the port of Emden, East Friesland. A good map of the docks, quays and other harbor improvements is given. 4000 w. 1 plate. Stahl u Eisen—May 1, 1906. No. 76809 D.

## Erosion.

The Coast Erosion and Sea Defences of North-Western Europe. Abstract of three articles by M. Bonnin, in *La Nature*, supplemented by observations. 1600 w. Engr, Lond—Dec. 1, 1905. No. 73696 A.

## Euphrates.

Plan for the Regulation of the Euphrates (Projet de Régularisation de l'Euphrate) F. Chochoy. A description of the Hindieh canal and the plans for a barrage for the distribution of the waters for the Euphrates near Hilleh. 1500 w. Génie Civil—March 10, 1906. No. 75719 D.

# CIVIL ENGINEERING

## Excavation

## WATERWAYS AND HARBORS

## Jetty

### Excavation.

Excavation of the West Neebish Channel, near Sault Ste. Marie. Work for the improvement of this channel of the St. Mary's River to increase the capacity of the connection between Lake Huron and Lake Superior is illustrated and described. 2400 w. Eng Rec—March 3, 1906. No. 75413.

Cost of Canal Excavation Through Peat and Soft Material. Information concerning the work accomplished by a Lidgerwood duplex traveling cableway of special design, in construction at the Hennepin Canal, near Wyand, Ill. 900 w. Eng Rec—April 7, 1906. No. 75984.

### Excavator.

A German Excavator on the New York Barge Canal. Emile Low. Brief account of the work near Oneida Lake, and an illustrated description of the type of excavator with transporter used. 700 w. Eng Rec—April 21, 1906. No. 76325.

### Flow.

An Examination of the Formulas for the Flow of Water in Practical Service (Streiflichter über die Bewegungsforneln des Wassers im Dienste des Wasserbaues) W. Plenkner. A comparison of the various modifications of the Chezy formula with the results obtained in actual gaugings. 6000 w. Oesterr Wochenschr f d Oeffent Baudienst—Oct. 6, 1906. No. 79979 D.

### Genoa.

Extension of the Port of Genoa. Plan and description of improvements in progress. 2200 w. Engr, Lond—May 11, 1906. No. 76765 A.

### Harbors.

The Port of San Pedro. An illustrated account of the development of this port of southern California, with explanation of the causes that have effected its improvement. 2200 w. Marine Rev—July 26, 1906. No. 78271.

### Harbor Works.

Seaham Harbor New Works. Illustrates and describes the important engineering works, recently completed, for the improvement of this harbor and docks. 1600 w. Engr, Lond—Nov. 10, 1905. No. 73298 A.

The Genoa Harbor Works. Reviews briefly the past history of the harbor works, and outlines the present scheme of enlargement. Plan. 2000 w. Engng—Jan. 19, 1906. No. 74744 A.

The Protection of Small Harbors on Lake Michigan. Notes from a report of

a board appointed to inquire into the effect of wave action as injuriously affecting the harbors, and to suggest a plan of resisting this action. 4000 w. Eng Rec—Jan. 20, 1906. No. 74502.

### Hooghly.

The River Hooghly. Leveson Francis Vernon-Harcourt. An account of this very interesting branch of the Ganges, founded upon very careful investigations, and a study of all the available charts. Ills. 41500 w. (No. 3478). Inst of Civ Engrs. No. 73151 N.

### India.

The Navigable Waterways of India. Robert Burton Buckley. Information, with maps, of the artificial and natural waterways of India, and matters relating to them. General discussion. 12500 w. Jour Soc of Arts—March 2, 1906. No. 75490 A.

### Inland Navigation.

The Royal Commission on Canals and Waterways. Gives evidence of witnesses examined by the Commission which contains information as to the present condition of English waterways and their future prospects. 3000 w. Engr, Lond—Oct. 12, 1906. Serial. 1st part. No. 80058 A.

### Irrigation.

Winning the West. C. J. Blanchard. An illustrated account of the progress of the reclamation service in reclaiming the desert. 5700 w. Nat Geog Mag—Feb., 1906. No. 75201 C.

### Italy.

The Maritime Ports of Italy (Les Ports Maritimes d'Italie). Baron Qui- nette de Rochemont and M. G. de Joly. An exhaustive study of the commercial and engineering features of Italian sea- ports, followed by a detailed description of the harbors of Genoa, Naples, and Venice. 20000 w. 6 plates. Am d Ponts et Chaussées—2 Trimestre, 1906. No. 79331 E + F.

### Jamaica, W. I.

Works for the control of the Wag Water River. J. Mark Fletcher. De- scribes the conditions existing in many rivers of the island of Jamaica, and the controlling works for the river named. Ills. 1000 w. Eng Rec—March 3, 1906. No. 75414.

### Jetty.

A New Ferro-Concrete Coal Jetty on the Thames. Illustrates and describes briefly the main features of a jetty being constructed on the Hennebique system. 900 w. Col Guard—June 8, 1906. No. 77385 A.

# CIVIL ENGINEERING

## Lake Port

## WATERWAYS AND HARBORS

## Obstructions

### Lake Port.

Port of Ashtabula. An illustrated article giving the history of this Lake Erie port, and showing the wonderful transformations that have taken place. 4000 w. Marine Rev—Sept. 20, 1906. No. 79298.

### Levees.

Levee and Drainage Works at Memphis. Describes the area requiring protection along the banks of the Mississippi, the levees, and a pumping plant having several unusual features. 4500 w. Eng Rec—April 21, 1906. No. 76323.

### Lift-Lock.

The Peterborough Lift-Lock of the Trent Valley Canal. Illustrates and describes this lock on the waterway being constructed to join Georgian Bay with Lake Ontario. It is the largest structure of this character in existence and is built almost exclusively of concrete. 1300 w. Sci Am—July 7, 1906. No. 77826.

### Lighthouse.

The Diamond Shoals Lighthouse. Illustrated description of a proposed structure off Cape Hatteras. Steel and concrete will be used in the construction. 2000 w. Sci Am—March 24, 1906. No. 75635.

The Construction of a Concrete Tower for the French Lighthouse Service. Illustrated description by M. Alexandre, translated from the *Annales des Ponts et Chaussées*. 2000 w. Cement—Sept., 1906. No. 79260 C.

### Locks.

Canal Locks and Lifts (Ueber Schleusentreppen und Schiffshebewerke). Fr. Jebens. A comparison of locks in series with inclined planes and lifts for overcoming differences of level in canals. 1800 w. Glaser's Annalen—Jan. 15, 1906. No. 74636 D.

Mechanical Lift Locks in America. Lieut-Col. Thomas W. Symons. Extracts from a paper submitted to the 10th Int. Nav. Cong. Describes the three kinds of mechanical locks suggested to accomplish the lift of 112 ft. at Cohoes, and the rather remarkable lock proposed for Lockport. 2000 w. Eng Rec—Dec. 16, 1905. No. 73921.

Formulas for the Time Required to Fill and Empty Canal Locks (Einfache Formeln für die Zeitdauer des Füllens und Entleerens von Kammerschleusen). Dr. P. Kresnik. A discussion of methods of economizing water for canal locks by the use of storage basins, with formulas for computing the rate of filling and emptying under such conditions. 3000 w.

Zeitschr d Oesterr Ing u Arch Ver—Feb. 9, 1906. No. 75128 D.

The Construction of a Second Tide Lock in the Merwede Canal at Utrecht (Over den Bouw eener Tweede Schutsluis in het Merwede Kanael bewesten Utrecht). A. E. Kempees. With plans of the lock and details of the foundations and photographs of construction work. 2500 w. De Ingenieur—July 7, 1906. No. 78182 D.

A Double-Chamber Lock System (Doppelkammer Schleuse mit Inertie wassersparwerk). A. Budan. Describing a system in which the flow of water between the lock chambers is utilized for driving the pumps. Two articles. 9000 w. Zeitschr d Oesterr Ing u Arch Ver—Sept. 14, 21, 1906. No. 79932, each D.

A Logical Solution of the Lock Question at the Sault. R. J. McKeone. Describes the type of lock recommended for fast operation. 1800 w. Marine Rev—Sept. 13, 1906. No. 79181.

### Mississippi.

The Protection of the Alluvial Basin of the Mississippi. Robert Marshall Brown. Describes the portion of the Mississippi Basin subject to inundation and the work to protect the land from floods. Maps. 4000 w. Pop Sci M—Sept., 1906. No. 78868 C.

### New South Wales.

Improvements at the Entrance to the Richmond River, New South Wales. Thomas Edward Burrows. Gives an account of the works carried out or in course of construction, in accordance with the recommendations of the late Sir John Coode. 5400 w. Ills. (No. 3503.) Inst of Civ Engrs. No. 73180 N.

### Niagara.

The American and Canadian Channels of Niagara Falls. Alton D. Adams. An illustrated description of the two channels with remarks on the effect of further diversions of water above the falls. 2000 w. Elec Rev, N Y—Nov. 11, 1905. No. 73115.

### Nile.

Remarks on Some Old-Time Engineering. T. C. Mendenhall. An interesting popular account of engineering work and conditions in the valley of the Nile. 6000 w. Jour Worcester Poly Inst—May, 1906. No. 77154 C.

### Obstructions.

Submarine Sweeps for Locating Obstructions in Navigable Waters. Francis C. Shenehon. Illustrates and describes the Lake Survey Pontoon Speed Sweeps, and describes other forms tried. 3300 w. Eng News—April 26, 1906. No. 76338.

# CIVIL ENGINEERING

Orinoco

WATERWAYS AND HARBORS

Panama

## Orinoco.

The Orinoco—A Wasted Waterway. G. L. M. Brown. Illustrated description of this remarkable river, its peculiarities, the vessels that navigate it, &c. 2200 w. Sci Am—Nov. 25, 1905. No. 73415.

## Ostend.

The Ostend Harbor Extensions. Gives briefly the history of this port of Belgium, and describes the harbor improvements in progress. 2500 w. Engng—April 13, 1906. 76199 A.

## Overflow.

The Levee and Drainage Problem of the American Bottoms. Edwin G. Helm. Discusses the protection from overflow of the Mississippi River and the drainage of the interior waters of the American Bottoms. 11700 w. Jour Assn of Engng Socs—Sept., 1905. No. 73484 C.

## Panama.

Mr. Wallace Before the Panama Board. A statement of the recommendations of the former Chief Engineer of the Isthmian Canal. 1700 w. R R Gaz—Vol. XXXIX., No. 22. No. 73543.

The Conflict of Engineers Over Plans for the Panama Canal. Three papers by Mr. William Ham. Hall discussing the relative merits of the several different plans for the canal and explaining some of the reasons for the conflict of opinion among engineers. 7000 w. Eng News—Nov. 30, 1905. Serial. 1st part. No. 73549.

Proposed Excavation of the Panama Canal by Floating Dredges. An illustrated article giving an outline of the plans proposed by Mr. Bunau-Varilla for the rapid construction of a high-level canal, and its final enlargement to a sea-level canal. 1300 w. Sci Am—Jan. 20, 1906. No. 74440.

Report of the Chief Engineer of the Isthmian Canal Commission. Portions of the report of Mr. John R. Stevens, which are of special interest to engineers. 5800 w. Eng News—Jan. 4, 1906. No. 74172.

Work on the Panama Canal. Brief outline of this project and the work that has been done, with many illustrations. 1200 w. Ry & Loc Engng—Jan., 1906. No. 74197 C.

Plain Facts about the Panama Canal. John F. Wallace. A straight talk about the real conditions of affairs on the isthmus, showing what red tape is costing, and emphasizing the great advantages of letting the work out by private contract. 5000 w. Engineering Magazine—March, 1906. No. 75161 B.

Testimony of John F. Stevens, Chief Engineer of the Isthmian Canal Commission, before the Senate Investigating Committee. Extracts containing the matter of most interest to engineers. 11000 w. Eng News—Feb. 8, 1906. No. 74913.

The Panama Canal. Hon Theodore P. Shonts. An address to the Commercial Club of Cincinnati, explaining the experiments with foreign labor, the arrangements for transportation facilities, and other questions. Ills. 5000 w. Nat Geog Mag—Feb., 1906. No. 75200 C.

The Report of the Board of Consulting Engineers for the Panama Canal. A summary of the report, with lengthy abstract of the majority report, favoring the sea-level canal, and recommendations of the Canal Commission approving the 85-ft. lock level plan. Also official reports on the plans. Ills. 16800 w. Eng News—Feb. 22, 1906. No. 75247.

A Proposed Plan for Excavating the Culebra Cut. Presents a plan worked out by Mr. John F. Wallace for the sequence of operations where the elevation is greatest and the largest volume of material to be removed. 2000 w. Eng News—March 1, 1906. No. 75303.

A Trip Through the Panama Canal in 1915. An illustrated description of the canal that is recommended with a presentation of the reasons that led the Commission to decide in favor of a canal with locks and high-level lakes. Editorials and article on sanitation of the canal zone included. 6000 w. Sci Am—March 10, 1906. No. 75430.

Preparing the Isthmus for Canal Construction Work. Fullerton L. Walds. An illustrated description of the conduct of sanitary work on the Isthmus, showing the extent of the measures which have been initiated, and the manner in which they are being carried out. 2500 w. Engineering Magazine—April, 1906. No. 75785 B.

Questions of Safety in a Lock Canal at Panama. Extracts from the Minority Report of the Board of Consulting Engineers for the Panama Canal. 3800 w. Eng Rec—March 17, 1906. No. 75570.

Shall the Panama Canal Be built by Contract? Editorial discussion of this subject, quoting from expressed views of Mr. J. F. Wallace. 3000 w. Eng News—March 15, 1906. No. 75531.

Some Concrete Work in Panama. Howard Egleston. The building of a sea-wall at Borcas del Toro is illustrated and described. 1200 w. Eng Rec—March 3, 1906. No. 75396.



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## Panama

## WATERWAYS AND HARBORS

## Panama

Some Phases of the Panama Problem. John F. Wallace. Abstract of an address delivered before the Illinois Manufacturers' Assn. Remarks on the construction of the canal, the Tehuantepec railroad, the Panama railroad and the rates. 3000 w. Ry Age—March 9, 1906 No. 75473.

Testimony of Mr. John F. Wallace before the Senate Committee on Inter-oceanic Canals. A condensed abstract of such features of the testimony as are of interest to engineers. 12500 w. Eng News—March 1, 1906. No. 75304.

The Adopted Plan for the Panama Canal. Editorial discussion favorable to a lock canal. 2700 w. Eng News—March 1, 1906. No. 75305.

The Gatun Dam of the Panama Lock Canal Project. Extracts from the Minority Report of the Board of Consulting Engineers for the Panama Canal. Describes the proposed dam, presenting reasons for the choice of this site and information concerning the construction and cost. 4500 w. Eng Rec—March 10, 1906. No. 75477.

The Panama Canal. A. G. Menocal. Submits, for discussion, a modification of the canal route recommended by the Isthmian Canal Commission of 1899-1901 for a lock canal, by which the River Chagres may be kept under absolute control. 4 plates. 2200 w. Pro Am Soc of Civ Engrs—Feb. 1906. No. 75340 E.

The Panama Railroad and the Canal. Fullerton L. Waldo. An illustrated article describing the improvements made in the Panama Railroad and the work expected of it. 800 w. R R Gaz—Vol. XL., No. 9. No. 75316.

An Engineer's Life in the Field on the Isthmus. Fullerton L. Waldo. A well illustrated account from actual experience on the canal work; together with a hitherto unpublished report on the Gamboa Dam. 6000 w. Engineering Magazine—Dec., 1905. No. 73372 B.

Progress on the Panama Canal Work. Information from the address of Hon. William H. Taft, before the St. Louis Commercial Club. Especially concerning the troubles and difficulties experienced during the last two years. 7200 w. Eng News—Nov. 23, 1905. No. 73424.

The Panama Contretemps. Editorial discussion of the present situation. 1800 w. R R Gaz—Vol. XXXIX., No. 21. No. 73430.

The Panama Water and Sewerage Works. An illustrated article describing the condition of the City of Panama be-

fore the treaty with the United States, and the work that has been done since in the water supply and sewerage departments. 2000 w. Eng Rec—Nov. 25, 1905. No. 73493.

The Real Conditions at Panama. Eugene P. Lyle, Jr. The second of a series of investigations of the problems involved in the control of the canal. 6800 w. World's Work—Nov., 1905. No. 72923 C.

What Has Been Accomplished at Panama. Theodore P. Shonts. Extracts from an address before the Am. Hardware Mfrs.' Assn. Discusses the sanitation of the Isthmus, and the providing of suitable habitations for all classes of employees, and the food supply. The difficulties to be overcome are explained. 3000 w. Eng News—Nov. 16, 1905. No. 73220.

A Novel Plan for Excavating the Culebra Cut. Fremont Hill. An illustrated perspective sketch of the method suggested, which proposes the driving of a three-track tunnel at an elevation just above the surface of the natural water courses, with shafts at intervals, and Lidgerwood traveling cableway excavators. 2000 w. Eng News—May 17, 1906. No. 76677.

Machinery for the Panama Canal—Old and New. Fullerton L. Waldo. An illustrated account of the old machinery left by the French, and the American revival and newly installed appliances. 2500 w. Engineering Magazine—June, 1906. No. 76873 B.

Present Conditions on the Panama Canal Works. T. P. Shonts. Condensed from a special report made by the chairman of the Isthmian Canal Commission to the Secretary of War. 2200 w. Eng News—May 17, 1906. No. 76681.

Statement of Hon. William H. Taft, Secretary of War, Before the Committee on Inter-oceanic Canals of the United States Senate. Portions of this statement, with editorial comment. 14700 w. Eng News—May 10, 1906. No. 76619.

The Administration View of Panama Canal Affairs. Extracts from the statement of Secretary Taft before the Senate Committee on Inter-oceanic Canals. 6500 w. Eng Rec—April 28, 1906. No. 76420.

The Majority Report of the Senate Committee on the Type of the Panama Canal. Gives the portions of the report of most interest, the locks and dams, risk in construction, earthquakes, and cost. 4500 w. Eng News—May 24, 1906. No. 76783.

The Panama Canal Under Control of the United States. Henry L. Abbot.

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## Panama

## WATERWAYS AND HARBORS

## Pier

Gives a review of the work of the Commission appointed Feb. 9, 1904, and the reorganization of the commission in April, 1905. 4000 w. Harvard Engng Jour—April, 1906. No. 76694 D.

Extracts from the Minority Report of the Senate Committee on the Type of the Panama Canal. 11800 w. Eng News—June 7, 1906. No. 77243.

The Panama Canal. Projets of the Board of Consulting Engineers. Gen. H. L. Abbot. A demonstration of the marked advantages of the lock type over the sea-level scheme, a view subsequently accepted by Congress. 4000 w. Engineering Magazine—July, 1906. No. 77681 B.

The Disputed Features of the Panama Canal. A letter from Mr. W. Henry Hunter, chief engineer of the Manchester Ship Canal, to the Senate Committee on Inter-oceanic Canals giving a statement of his views in regard to the dangers of the lock-canal plan. Also editorial. 6800 w. Eng Rec—June 2, 1906. No. 77072.

Mining Methods for the Culebra Cut. H. M. Chance. A discussion of the applicability of the well-known "milling" system of undercutting by tunnels and shafts, to the economical excavation of the Culebra Cut on the Panama canal. 3000 w. Engineering Magazine—July, 1906. No. 77688 B.

What is Worth While? Editorial discussing the question of a sea-level or lock-canal at Panama, favoring the latter. 2500 w. Eng News—May 31, 1906. No. 77042.

A New Type of Sixty Foot Summit Level Canal for Panama. Gives profile and plan of Panama Canal proposal with four locks and 60-foot summit level, discussing its advantages. 1800 w. Sci Am—Sept. 1, 1906. No. 78907.

The Risk of Locks in Flight. Editorial criticising the feature of the plans for the Panama Canal which call for the construction of three great locks with a total lift of 85 feet "in flight." 1000 w. Sci Am—Aug. 4, 1906. No. 78422.

A Request for Bids for the Construction of the Panama Canal on a Percentage Basis. A letter from T. P. Shonts to the Secretary of War stating reasons for adopting this plan. 2800 w. Eng News—Oct. 11, 1906. No. 79723.

Mechanical Equipment of the Panama Canal. Charles W. Burke. Describes some of the machinery placed on the Isthmus by the original French company, explaining why it has proved useless, and

describing the machines substituted. Ills. 3300 w. Eng Rec—Oct. 27, 1906. No. 80108.

Panama—Past and Present. W. J. Karner. An illustrated article describing the country and briefly reviewing its history and the canal project to date. Map. 4500 w. Jour W Soc of Engrs—Oct., 1906. No. 80004 D.

The Form of Contract for the Completion of the Panama Canal, on Which Bids are to be Received Dec. 12. Presents the terms of the contract on which bids are invited. Also editorial explaining what the contractor is to do and his chances for profit and loss. 8000 w. Eng News—Oct. 18, 1906. No. 79832.

Concerning the Gatun Dam. Substance of the testimony of Prof Wm. H. Burr, before the Senate Committee, favoring the sea-level canal; and of Frederic P. Stearns in answer to the criticisms of the design of this dam. Also editorial. 10500 w. Eng News—March 29, 1906. No. 75865.

Recent Controversy and Conditions at Panama. Fullerton L. Waldo. A letter discussing the sea-level plan and the work thus far accomplished on the isthmus. 1800 w. R R Gaz—April 20, 1906. No. 76150.

The Probable Tonnage of the Panama Canal. Editorial discussing the views of John F. Wallace, Prof. Emory R. Johnson, and the estimates published, and the bearing on the type of canal to build. 3500 w. Eng News—April 19, 1906. No. 76132.

## Paris.

The Port of Paris (Le Port de Paris). Pierre Jolibois. A detailed account of the growth of the port and its successive improvements since the beginning of the nineteenth century. 10000 w. Revue Technique—Oct. 25, 1905. No. 73834 D.

## Pier.

Pier in Reinforced Concrete on the Guadalquivir, Spain (Embarcadero de Hormigon Armado en el Guadalquivir). Juan Manuel de Zafra. Illustrated description of a pier constructed on the Hennebique system, with double track, and unloading derrick. 2000 w. 3 plates. Revista de Obras Publicas—Nov. 15, 1905. No. 73869 D.

Viaduct and Pier in Reinforced Concrete at the Cala Mines, Spain (Viaducs et Appontement en Béton Armé de la Société des Mines de Cala, Espagne). Juan Manuel de Zafra. Illustrating a pier and approaches constructed on the Hennebique system of reinforced concrete, for handling

# CIVIL ENGINEERING

## Pier Sheds

iron ore at a railway terminus on the Guadalquivir, below Seville. 2000 w. 1 plate. Génie Civil—Dec. 23, 1905. No. 74627 D.

Reconstruction of the Atlantic City "Steel Pier" in Reinforced Concrete. An illustrated article describing the plan of construction, and rebuilding. 2500 w. Eng News—July 26, 1906. No. 78233.

Storage and Shipment of Iron Ore at Almeria. John Ernest Harrison. An illustrated description of the Alquife Co.'s pier in the south of Spain, and the appliances for the shipment of hematite ore. 3300 w. Inst of Civ Engrs—No. 3564. No. 78020 N.

## Pier Sheds.

The New Steel Pier Sheds on the East River, New York. Illustrates and describes pier sheds being erected which will be leased for terms of ten years; the improvements and standard design, and the methods of construction are considered. 2000 w. Eng Rec—June 9, 1906. No. 77240.

## Port.

New Lake Port. An illustrated account of a new harbor, known as Gary, being developed by the United States Steel Corporation at the extreme southern end of Lake Michigan in Indiana. 2500 w. Marine Rev—June 21, 1906. No. 77448.

The Port of London. Editorial discussion of the present condition of this port, and its needs. 3000 w. Engng—Jan. 19, 1906. No. 74749 A.

## Rhine.

The Industrial Harbors of the Lower Rhine (Die Niederrheinischen Industriehäfen). Paul Berkenkamp. With especial reference to the equipment of harbors with mechanical handling appliances for the coal and iron trade. Map. 4000 w. 1 plate. Stahl u Eisen—Sept. 1, 1906. No. 78369 D.

## River Flow.

See Mechanical Engineering, Hydraulics.

## River Improvement.

The Grand River, Ontario Peninsula. W. H. Breithaupt. Discusses the effects of deforestation and swamp drainage, and the need of river improvement. Ills. 2000 w. Can Soc of Civ Engrs—Dec. 14, 1905. (Adv. proof.) No. 74089 C.

Notes on the Regulation of Tidal Rivers (Bemerkungen Zu der Regulierungsarbeiten auf Tideströmen). A. v. Horn. Discussing especially the construction of embankments, levees, and jetties, for the maintenance of channels in streams sub-

## WATERWAYS AND HARBORS

## Ship Canal

ject to the ebb and flow of tides. 3000 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—April 28, 1906. No. 76835 D.

The Improvement of the Tennessee River and Power Installation of the Chattanooga and Tennessee River Power Company at Hale's Bar, Tenn. Thomas E. Murray. Describes work undertaken to improve the navigation of the river, and also applied to the development of electrical energy. Ills. 6500 w. Am Soc of Mech Engrs. No. 097—May, 1906. No. 76759 C.

The Rate of Filling the Salton Sink Basin by the Diversion of the Colorado River. Maps and report of the difficulties encountered in California in connection with an irrigation project, and the attempts to remedy the trouble. 1000 w. Eng News—May 10, 1906. No. 76618.

## River Regulation.

Regulation Works in Upper Austria (Die Gewässerregulierung in Oberösterreich). S. Stern. Illustrating the improvement works which have been conducted on the Ager and its tributaries in the districts of St. Georgen, Berg, and Vöcklamarkl, upper Austria. 3000 w. 2 plates. Oesterr Wochenschr f d Oeffent Baudienst—Jan. 27, 1906. No. 75132 D.

Regulating Dams for the San Juan and Mendoza, Argentina (Diques Niveladores de San Juan y Mendoza). Oreste Vulpiani. A report to the government, showing the importance of rebuilding the regulating dam on the San Juan, in a manner similar to that already done on the Mendoza. 4000 w. La Ingenieria—May 15, 1906. No. 78183 D.

## Sea Walls.

The New Sea-Wall at Annapolis, Md. Harrison W. Latta. Describes the construction of this wall. 2200 w. Pro Engrs' Club of Phila—July, 1906. No. 78598 D.

The Stability of Sea Walls. D. C. Serber. Gives methods and formulas applied to various cases. 3500 w. Eng News—Aug. 23, 1906. No. 78692.

## Sedimentation.

Sedimentation: Its Relation to Drainage. J. W. Dappert. Abstract of a paper presented at meeting of the Illinois Soc. of Engrs. & Survs. A study of the sedimentation in drainage work, with a statement of the writer's conclusions. 3000 w. Eng News—Feb. 1, 1906. No. 74810.

## Ship Canal.

The East Bay Neck Ship-Canal, Tasmania. Charles Napier Bell. A brief description of a ship-canal across a penin-

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## Silt

sula on the east coast of Tasmania, for the use of coasting steamers and fishing craft. 300 w. Inst of Civ Engrs. (No. 3563.) No. 74351 N.

The Proposed Norwich and Yarmouth Ship Canal. Map and description of a scheme to build a ship canal in England, with a statement of the advantages expected. 2500 w. Engr, Lond—May 18, 1906. No. 77018 A.

The Bruges Ship Canal (Der Brügger Seekanal). W. Kaemmerer. A detailed account of the canal from Bruges to the North Sea at Heyst, now nearly completed. It is 12.75 kilometres in length, with 8 metres depth of water. 3000 w. Zeitschr d Ver Deutscher Ing—May 26, 1906. No. 77602 D.

The Great Ship Canals of the World. Ambrose G. Grandpre. Brief accounts of ten such canals already built. 2500 w. Technograph—No. 20. No. 77167 D.

Lake Erie and Ohio River Ship Canal from Ashtabula to Pittsburg. Maps and information concerning this project. 2000 w. Marine Rev—Sept. 20, 1906. No. 79299.

## Silt.

Silt and Scour. A discussion of the theories of silt and scour, and their errors, reviewing the opinions and arguments of Bellasis. 4000 w. Engr, Lond—Oct. 19, 1906. No. 80145 A.

## Slipway.

Electrically-Operated Slipway Haulage. Illustrated description of an interesting electrically-operated gear for hauling ships up the slipway. 1000 w. Engng—Aug. 10, 1906. No. 78674 A.

## Suez Canal.

The Clearing of the Suez Canal from Obstruction by a Dynamite Ship (Déblaiement du Canal de Suez Obstrué par un Navire Chargé de Dynamite). An illustrated account of the clearing of the

## MISCELLANY

Suez Canal from the wreck of the dynamite steamship Chatham. 2000 w. Génie Civil—Nov. 18, 1905. No. 73809 D.

## Thames.

The Thames Conservancy. Describing the work of improving and deepening the navigable channel which is in progress and proposed. 1700 w. Engr, Lond—July 20, 1906. Serial. 1st part. No. 78318 A.

## Tides.

Pacific Coast Tides and the Determination of Mean Sea Level. W. B. Dawson. Extract from a report entitled "Tide Levels and Datum Planes on the Pacific Coast of Canada," presented before the Canadian Soc. of Civ. Engrs. 1000 w. Eng News—June 28, 1906. No. 77531.

## Towage.

Electrical Canal Towage in Germany. An illustrated article describing the canal and the arrangements for electrical towing, as well as some experiments that proved too costly. 2500 w. Elec Wld—Aug. 11, 1906. No. 78524.

## Vienna.

The Improved Winter Harbor at Freudenau (Der Schutz und Winterhafen in der Freudenau). Illustrating and describing the improved docks and harbor works at Freudenau on the Danube, at Vienna. 4000 w. 4 plates. Oesterr Wochenschr f d Oeffent Baudienst—

## Water Flow.

See Mechanical Engng, Hydraulics.

## Wharves.

Steel Wharves at Manila. Sections and description of two wharves under construction. Both have platforms of steel beams and girders carrying reinforced concrete floor slabs and supported by rows of small reinforced concrete piers with steel shells and pile foundations. 1000 w. Eng Rec—June 16, 1906. No. 77340.

# MISCELLANY

## Australasia.

Engineering Work in Australasia: a Retrospect. Edward Dobson. An account of the engineering work during the past 55 years. 4800 w. Inst of Civ Engrs—No. 3613. No. 79518 N.

## Colorado.

Engineering in the Pike's Peak Region. John Birkinbine. Discusses some of the special problems that have been, or are yet to be solved by engineers in the vicinity of Pike's Peak—the railroads,

water problems, etc. Ills. 6000 w. Casier's Mag—Oct., 1906. No. 79523 B.

## Earthquakes.

Earthquakes Along the Coast of South America. A. Lakes. Gives notes from the journal of Charles Darwin describing an earthquake in this region. 1400 w. Min Rept—Sept. 6, 1906. No. 79065.

## Fire Losses.

Conclusion from the San Francisco Conflagration. S. Albert Reed. Extracts from a report to the Committee of

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## Reclamation

Twenty, National Board of Underwriters, giving the more important lessons from this great fire. 2800 w. *Munic Engng*—Oct., 1906. No. 79733 C.

## Reclamation.

Engineering Construction by the United States Reclamation Service. M. O. Leighton. Information concerning the great water-supply installations west of the Mississippi for the purposes of irrigation, which involve an expenditure of over \$30,000,000. Ills. Discussion. 5500 w. *Jour N Eng W-Wks Assn*—June, 1906. No. 77502 F.

Reclaiming the Site of Grant Park, Chicago. An illustrated account of land being reclaimed for a city park in the business district along Lake Michigan. It will require 7,000,000 cu. yds. of filling. About 5,000,000 cu. yds. are already in place. 3700 w. *Eng Rec*—June 16, 1906. No. 77344.

## COMMUNICATION

### Review.

Civil Engineering in 1905. An editorial review of the year briefly considering the progress in the different countries. 5000 w. *Engr, Lond*—Jan. 5, 1906. No. 74427 A.

### Sand Waves.

Sand Waves and Their Work. Day Allen Willey. An illustrated article describing the formations of sand dunes, and the effect of winds, and the methods that have been tried to check the movement of the sand. 1800 w. *Sci Am*—Feb. 24, 1906. No. 75086.

### Specifications.

Decision on Appeal in the Manhattan Bridge Contract Case. Also editorial. Gives the main parts of the opinion that specifications on public contracts must accurately define the work. 5400 w. *Eng News*—Feb. 1, 1906. No. 74807.

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### Address.

Presidential Address to the Institution of Electrical Engineers. John Gavey. Principally a discussion of telegraphy and telephony, and their problems. 12800 w. *Elect'n, Lond*—Nov. 10, 17, 1905. Serial. 2 parts. No. 73459 each A.

### Arizona.

Telephone Engineering in "The Country God Forgot." George Bond Ellison. An amusing account of difficult work in Arizona. Ills. 3500 w. *Jour of Elec*—Nov., 1905. No. 73068 C.

### Cables.

The Last Link of the All-American Pacific Cable. Lewis G. Martin. An illustrated account of the laying of an underground cable to connect the Manila-Shanghai submarine cable with the cable office in Shanghai. 1800 w. *Elec Rev, N Y*—May 19, 1906. No. 76724.

Submarine Cables. H. C. Specht. Describes the construction, laying and repair of a modern submarine cable. Ills. Discussion. 4000 w. *Pro Engrs' Soc of W Penn*—July, 1906. No. 78246 D.

A Modification of the Cable Zero Conductor Resistance Test for Submarine Cables. G. B. Winkfield. Gives the actual routine suggested for testing a laid section of cable. This method has given more satisfactory results than any test hitherto published. 900 w. *Elec Rev, Lond*—July 27, 1906. No. 78466 A.

A Modification of the Cable Zero Conductor Resistance Test for Submarine Cables. G. B. Winkfield. Brief description of the proposed method, stating its advantages. 800 w. *Elect'n, Lond*—May 25, 1906. No. 77129 A.

### Cable Laying.

Cable Gear for a new Japanese Cable Ship. Gives plan and elevation of the ship, and illustrated description of the machinery, especially the combined picking-up and playing-out machine. 1500 w. *Elect'n, Lond*—March 23, 1906. No. 75901 A.

### Cable Steamer.

See Marine and Naval Engineering.

### Coherers.

Theory of Coherer Action. From the *English Mechanic and World of Science*. Briefly discusses the theories advanced by Lodge, Branly, Bose, and Dr. Guthe, especially the last named. Also the theory developed by Dr. Lee de Forest, and gives a description of two of the coherers used in wireless telegraphy. 4000 w. *Sci Am Sup*—Nov. 11, 1905. No. 73094.

### Exchange.

A New Telephone Trunk Exchange in Birmingham. Describes some of the improvements introduced in this new exchange. One of the most interesting is the use of the telegraph sounder as an aid to the telephone circuits. Ills. 2000

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## Long Distance

w. Elect'n Lond—June 15, 1906. No. 77479 A.

## Long Distance.

Long-Distance Telegraphy in Australia. T. Howard. An account of a trial of long-distance working over the Australian telegraph lines. 1000 w. Elec Rev, N Y—Nov. 25, 1905. No. 73471.

## Maintenance.

Care and Maintenance of Equipment. R. A. Walker. Read before the Iowa Telephone Assn. Considers the care of office equipment, cables and aerial lines, and instruments. 2000 w. Elec Rev, N Y—April 14, 1906. No. 76054.

## Multiple Telegraphy.

The Application of the Hughes System to Multiplex Telegraphy (Ein System für Wechselzeitige Mehrfach telegraphisch mittels Hughes-Apparaten). Karl Hansel. With details of the wiring, relay connections and synchronizing, to adapt the Hughes printing telegraph to duplex and multiplex service. Two articles. 5000 w. Elektrotech u Maschinenbau—March 4, 11, 1906. No. 75748 each D.

## Overland Route.

A Brief History of the Overland Telegraph Line from America to Europe. Extract from the report of the Minister of Mines, British Columbia, giving an account of the Collins Overland Telegraph Co.'s lines, begun in 1865 and abandoned in 1866 when the Atlantic cable was successfully laid. 1700 w. Eng News—Sept. 6, 1906. No. 79091.

## Printing Telegraph.

The Murray Automatic Page-Printing Telegraph—Its History and Its Progress. Photograph with account of the development. 1600 w. Sci Am—Sept. 8, 1906. No. 79080.

## Pupin System.

Observations on the Pupin Telephone System (Beobachtungen an Telefonleitungen Pupinschen Systems). Robert Nowotny. An account of experience with the long-distance line between Vienna and Innsbruck showing the improvement due to the Pupin loading coils. 3000 w. Elektrotechnik u Maschinenbau—April 1, 1906. No. 76255 D.

## Railroad Telegraphs.

The Traffic of Railway Communication. Frank E. Fowle. Read before the Assn. of Ry. Telegraph Supts. A plea for a broader view of the functions of a telegraph department and its relation to the question of railway communication. 3000 w. Ry Age—Sept. 7, 1906. No. 79073.

## COMMUNICATION

## Space Telegraphy

## Receivers.

Carborundum as a Wireless Telegraph Receiver. H. J. Round. Reviews the investigation to determine the action of carborundum. The most striking point noticed was its absolute constancy. 500 w. Elec Wld—Aug. 25, 1906. No. 78864.

## Relay.

A Telephone Relay. John Trowbridge. Reviews the development of the telephonic relay, considering the principles involved in its construction, and describes the relay invented by the writer. Ills. 3000 w. Am Jour of Sci—May, 1906. No. 76691 D.

## Signaling.

Apparatus for Electric Signaling and Firing for Mortar Batteries. William C. Davis. States the important requisites for signaling and for firing apparatus, and describes the proposed apparatus for electric signaling and firing for mortar batteries. Ills. 4000 w. Jour U S Art—March, 1906. No. 76793 D.

## Space Telegraphy.

A Method of Testing Wireless Receivers. Greenleaf W. Pickard. Describes a method used by the writer. Diagram. 1000 w. Elec Wld & Engr—Nov. 25, 1905. No. 73469.

Earthed and Unearthed Radiators in Wireless Telegraphy. W. H. Eccles. A statement of the reasons and facts that have made the use of the earthed radiator almost universal and the use of one unearthed rather exceptional. 1800 w. Elect'n, Lond—Oct. 27, 1905. No. 73003 A.

The Strasburg Experiments upon Directed Wireless Telegraphy (Die Strassburger Versuche über Gerichtete Drahtlose Telegraphie). Dr. Ferdinand Braun. Describing the use of two sets of waves of very slight phase difference to enable the direction of the transmission to be controlled. 2000 w. Elektrotech u Polytech Rundschau—Nov. 1, 1905. No. 73362 D.

Recent Advances in Wireless Telegraphy. J. Erskine-Murray. Abstract of a paper before the Glasgow Sec. of the Inst. of Elec. Engrs. Explains the Marconi untuned coherer system, the modern tuned systems, the more recent systems, the transmitters, limit of distance, &c. 5800 w. Elect'n, Lond—Dec. 15, 1905. No. 74049 A.

The Murgas System of Wireless Telegraphy. Joseph Murgas. Illustrated description of this invention for transmitting intelligence. The main object is to produce different spark frequencies from a source of current without the employ-

# ELECTRICAL ENGINEERING

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## Space Telegraphy

ment of interrupters. 1500 w. Elec Rev, N Y—Dec. 2, 1905. No. 73511.

The Production of Mechanical Effects by the Electric Current at a Distance (Production à Distance des Effets Mécaniques du Courant Electrique sans Fil de Ligne). C. D. Kubitzki. An illustrated description of the apparatus of Branly for controlling distant electrical devices by magnetic waves. 2000 w. Revue Technique—Oct. 25, 1905. No. 73833 D.

Notes on a Wireless Telegraph System. C. C. F. Monckton. On the Trinidad-Tobago wireless system describing the working of the insulated Lodge-Muirhead sender. Ills. 2500 w. Elect'n, Lond—Jan. 12, 1906. No. 74518 A.

The Limiting Factors of Syntonic Wireless Telegraphy. J. Hettinger. Aims to show a method which permits the discussion of the practical value of syntony when the resonance curves are experimentally determined, and to prove that the resonance method, as utilized now, may be a partial solution for avoiding interference, but never can be a general one. 2000 w. Elec Engr, Lond—Dec. 22, 1905. No. 74139 A.

The Orling-Armstrong system of Wireless Telegraphy and Telephony. A. Frederick Collins. Illustrated detailed description of this system. 1500 w. Elec Wld & Engr—Dec. 30, 1905. No. 74166.

The Bell Tetrahedral Kite in Wireless Telegraphy. An illustrated account of the recent successful transmission of messages between Long Island and Ireland, by means of kite-supported aerials. 800 w. Sci Am—April 21, 1906. No. 76134.

Wireless Telegraphy by Means of Kites. Waldon Fawcett. An illustrated article describing the experiments being carried out by Dr. A. Graham Bell, in the utilization of tetrahedral kites as an aid in wireless telegraphy. 500 w. Elec Rev N Y—April 7, 1906. No. 75993.

Advantageous Use of Highly Magnetic Metal in Radiation Conductors. James Foster King. Gives deductions from the effects obtained in some qualitative experiments along this line. 1400 w. Elec Wld—Feb. 10, 1906. No. 74971.

Braun's New Method of Directing Wireless Messages. A. Frederick Collins. Describes a new method for directing wireless messages, based on the theory of wave intensification and rarefaction by interference. 1200 w. Sci Am—Feb. 3, 1906. No. 74811.

The De Forrest Syntonic System of Wireless Telegraphy. A. Frederick Collins.

Describes the improvements that have been introduced in this system, especially the use of Lecher's wires as a tuning and syntonizing device. Diagrams. 4200 w. Sci Am Sup—Feb. 10, 1906. No. 74955.

Transmitting Distance in Wireless Telegraphy. Capt. L. D. Wildman. Discusses the formula deduced by J. Erskine-Murray for indicating the limit of distance in transmission, and gives the writer's opinion in regard to the influence of the weather at the sending station, based on experience in Alaska. 1000 w. Elec Wld—Feb. 10, 1906. No. 74970.

Atmospheric Electricity and Trees. Prof. A. G. McAdie. An illustrated discussion of the effect of sunshine on transmission of wireless messages, the behavior of trees during thunder storms, wireless experiments with trees, etc. 3800 w. Elec Wld—April 28, 1906. No. 76590.

Massie Wireless Telegraph System. Illustrated description of this system as used at the present time. 2000 w. Elec Wld—April 28, 1906. No. 76589.

On a Method of Obtaining Continuous Currents from a Magnetic Detector of the Self-Restoring Type. L. H. Walter. Read before the Royal Soc. Describes a method by which the author has succeeded in obtaining continuous unidirectional currents from a detector in which the energy available is derived in part from the external field. 1500 w. Elect'n, Lond—May 18, 1906. No. 76992 A.

On Methods Whereby the Radiation of Electric Waves May Be Mainly Confined to Certain Directions, and Whereby the Receptivity of a Receiver May Be Restricted to Electric Waves Emanating from Certain Directions. G. Marconi. Read before the Royal Soc. Reports results obtained by substituting a horizontal direct-excited air wire directed toward the receiving station, at a comparatively small distance above the surface. Diagrams. 2000 w. Elect'n, Lond—May 4, 1906. No. 76663 A.

Wireless Telegraphy. Reginald A. Fessenden. Gives a brief description of some of the work done by the writer relative to the determination of laws governing the propagation of wireless disturbances, with some new facts hitherto unpublished. 3000 w. Elec Rev, Lond—May 11, 1906. Serial. 1st part. No. 76755 A.

Wireless Telegraphy from the Andaman Islands to the Mainland of Burma. Copy of a report relating to this installation, with map showing the position. 2500 w. Elect'n, Lond—April 27, 1906. No. 76563 A.

# ELECTRICAL ENGINEERING

## Space Telegraphy

On Directed Wireless Telegraphy. Prof. Dr. F. Braun. An account of recent experimental work in this field, which gives promise of a distinct advance. Also editorial. 4200 w. *Elect'n, Lond*—May 25, 1906. Serial. 1st part. No. 77130 A.

The Commercial Aspect of Wireless Telegraphy. Edwin Edser. A sketch showing the applications made and the successful working of over-sea transmission. 2200 w. *Elec Engr, Lond*—June 1, 1906. No. 77264 A.

A Note on the Theory of Directive Antennæ or Unsymmetrical Hertzian Oscillators. J. A. Fleming. Read before the Royal Soc. Gives a mathematical explanation of the fact that a bent oscillator radiates more in the direction opposite to that in which the free ends point than it does in the other direction. 1700 w. *Elect'n, Lond*—July 6, 1906. No. 77971 A.

Interference in Wireless Telegraphy and the International Telegraph Conference. R. A. Fessenden. Deals with the subject of selective receptions of wireless telegraph messages. 2200 w. *Elec Rev, Lond*—July 6, 1906. Serial. 1st part. No. 77969 A.

Wanted: A Synthetic Wireless. B. T. Walling. Discusses the present outlook for a satisfactory synthetic system, giving a report of tests made at Culbra, and considering some effects of synthesis. 3500 w. *Pro U S Nav Inst*—June, 1906. No. 78031 G.

Wireless Telegraphy. H. M. Hozier. A sketch of the position of wireless telegraphy in the United Kingdom, and the movement to place it under government control. Also briefly considers its development in other countries, and applications which may possibly be made. 3000 w. *Nineteenth Cent*—July, 1906. No. 78002 D.

The Elevated Conductor in Wireless Telegraphy. H. J. Round. Reviews the development in aerial wires and the results. 1500 w. *Elec Wld*—July 28, 1906. No. 78339.

Directed Wireless Telegraphy. H. J. Round. Discussion of the results recorded in Marconi's paper before the Royal Soc. of London. Diagrams. 1000 w. *Elec Wld*—Sept. 22, 1906. No. 79476.

The Tuning of Transmitters for Space Telegraphy (Ueber die Abstimmung Funkentelegraphischer Sender). Max Wien. Discussing especially the late researches of Dr. Slaby, and the theory developed from them. 6000 w. *Elektrotech Zeitschr*—Sept. 6, 1906. No. 79359 B.

Wave Lengths in Wireless Telegraphy.

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H. J. Round. Gives results of experiments on the effect of varying the wave length used between two wireless stations with land between them. 700 w. *Elec Wld*—Sept. 15, 1906. No. 79248.

Wireless Telegraphy and Mr. Marconi. J. Henniker-Heaton. In defense of Marconi's great invention. 4000 w. *Nineteenth Cent*—Sept., 1906. No. 79276 D.

The Audion. Lee de Forest. An interesting account of the development of a new receiver for wireless telegraphy. 9500 w. *Pro Am Inst of Elec Engrs*—Oct., 1906. No. 80098 D.

The Design and Construction of a 100-Mile Wireless Telegraph Set. A. Frederick Collins. Illustrated detailed description of the sending and receiving apparatus. 3500 w. *Sci Am Sup*—Oct. 6, 1906. No. 79635.

The International Spark Telegraphy Conference. Editorial on some of the questions under discussion and the important interests at stake. 3300 w. *Engng*—Oct. 19, 1906. No. 80142 A.

The Latest form of Stations for Wireless Telegraphy on the Telefunken System (Beschreibung der Neuesten Form von stationen für Drahtlose Telegraphie nach der System Telefunken). K. Solff. Illustrating the wiring, arrangement of antennæ, and instruments, with details of the stations at Scheveningen, and in Java and Cuba. 3500 w. *Elektrotech Zeitschr*—Sept. 20, 1906. No. 79951 B.

The Status of the Liquid Barretter. An explanation of this electrolytic detector invented by Fessenden, and an account of the suits brought for assertions of ownership. 1000 w. *Sci Am*—Oct. 20, 1906. No. 79869.

Wireless Telegraphy in Railway Signalling (Die Drahtlose Telegraphie im Eisenbahn-Sicherungsdienst). Eugen Nesper. Experiments upon the Prussian Military Railway show that wireless signals may be sent 12 kilometres without interfering with the regular telegraph service, using ordinary operators. 3500 w. *Elektrotech Zeitschr*—Sept. 27, 1906. No. 79957 B.

## Telegraph Works.

The India Rubber, Gutta Percha, and Telegraph Works Company. Limited, Silvertown. Gives the history and general description of the plant, and detailed descriptions of the submarine cable, instruments, batteries, and other products manufactured. Ills. 5500 w. *Elec Engr, Lond*—May 25, 1906. No. 77125 A.

## Telegraphy.

The Jones Phantoplex Telegraph Sys-



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## Telephony

tem. Describes a system employing alternating currents of equal frequencies to be superimposed upon ordinary telegraph lines already operated by the present Morse systems, for increasing the facilities of the wires for the transmission of messages. Ills. 1000 w. *Elec Wld & Engr*—Dec. 30, 1905. No. 74167.

The London-Glasgow Underground Telegraph System. Illustrates and describes the construction of the pipe line in the present number. 1100 w. *Elec Rev, Lond*—Jan. 12, 1906. Serial. 1st part. No. 74512 A.

A Theoretical Study of Electric Circuits for Telegraphic Purposes (*Theoretische Beschouwingen over Stroomketens voor Telegraphische Doellinden*). J. C. D. M. de Roos. An exhaustive mathematical study of the most efficient current pressures for telegraphy. 30000 w. *Tijdschr van het Kijk Inst van Ing*—Feb. 3, 1906. No. 78186 H.

Telegraphy and Wireless Telegraphy During the San Francisco Disaster. W. R. Carroll. A brief account of the service rendered by the wireless system. 1200 w. *Sci Am*—July 28, 1906. No. 78268.

Experimental Studies of Telegraphic Transmission (*L'Etude Expérimentale des Transmissions Télégraphiques*). M. Devaux-Charbonnel. Describing applications of the oscillograph to the determination of the velocity of wave propagation over telegraph circuits. 1500 w. *Comptes Rendus*—July 23, 1906. No. 78724 D.

Improved Telegraph Switchboard Arrangement for Use with Storage Batteries (*Verbesserte Schalteinrichtung für die im Telegraphenbetriebe Verwendeten Sammler batterien*). G. Knopf. Describing the former and modern switchboard systems of the German government telegraphs. 4500 w. *Elektrotech Zeitschr*—Oct. 4, 1906. No. 79958 B.

## Telephony.

The Kellogg Common-Battery Telephone System. W. S. Henry. Illustrated description of this system as installed in Philadelphia. 1000 w. *Am Elect'n*—Nov., 1905. No. 73057.

The Use of the Telephone in Army and Navy Manœuvres. Col. B. K. Roberts. An account of the communications used during the recent Army and Navy exercises, to keep the officers informed as to the movements and approach of the Navy in its attack on the forts which defended the City of Washington. 1200 w. *Elec Wld & Engr*—Nov. 4, 1905. No. 73073.

Voice Overtones, or Harmonics, as Af-

## COMMUNICATION

fecting Long-Distance Telephone Transmission. D. MacL. Therrell. Describes an apparatus and experiments for improving articulation. 4500 w. *Elec Wld & Engr*—Nov. 11, 1905. No. 73202.

A Review of Telephone Patents Issued in 1905. Edward E. Clement. A brief commentary on the most interesting and significant of these patents. 4000 w. *Elec Rev, N Y*—Feb. 3, 1906. Serial. 1st part. No. 74825.

The Post-Office Telephone System. Illustrated description of the new "City" exchange in London. 2500 w. *Elec Rev, Lond*—Jan. 26, 1906. Serial. 1st part. No. 74876 A.

The Telephone System of the Future—The Semi-Automatic. Le Roy W. Stanton. Outlines this system, presenting its advantages. 1200 w. *Elec Rev, N. Y.*—March 10, 1906. No. 75448.

Telephone Engineering as a Profession. C. E. Scribner. Discusses phases of telephone engineering and the problems, and the opportunity for young engineers in this field. 4500 w. *Sib Jour of Engng*—March, 1906. No. 76095 C.

Telephone Engineering. J. J. Carty. Discusses the true scope of telephone engineering, presenting a typical problem in telephone management, illustrating the points made. 10200 w. *Am Inst of Elec Engrs*—March, 1906. No. 76116 D.

The Application of Self-Induction to Long-Distance Telephony. Aims to give some account of the theory now generally admitted to be correct, and to show its application to the problem of long-distance telephony. 4000 w. *Elec Engr, Lond*—April 6, 1906. No. 76071 A.

The Telephone Cable. G. S. Macomber. Illustrates and describes the manufacture of the standard telephone cable, with information relating to their use. 2200 w. *Sib Jour of Engng*—March, 1906. No. 76096 C.

Experiments on the Inductive Vienna-Innsbruck Telephone Line. Describes a series of interesting tests carried out on a line "loaded" inductively according to the Pupin system. 700 w. *Elect'n, Lond*—May 4, 1906. No. 76662 A.

Standardization of Methods and Appliances in Telephony. Frank R. McBerty. A discussion of the considerations tending toward the standardizing of appliances, and also some of the disadvantages. General discussion follows. 6800 w. *Jour W Soc of Engrs*—April, 1906. No. 76931 D.

The Lorimer Automatic Telephone. An illustrated explanation of the action and advantages of a new invention by

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## Tele-Photography

two Americans, now on trial at Paris. 1600 w. Sci Am—May 26, 1906. No. 76787.

The Telephone System of Today. C. J. H. Woodbury. Remarks on the early attempts at transmission of sound, the telephone instrument, transmitter, administration of the telephone system, lines, switchboard, uses, rates, etc. Discussion. 14000 w. Pro Engrs' Club of Phila—April, 1906. No. 76937 D.

The Telephone in Railroad Service. H. L. Burdick and W. T. Saunders. General remarks on the growing use of the telephone in railway operation, with a description of the development on the Burlington system. Ills. 2800 w. Ry Age—July 20, 1900. No. 78094.

The Telephone Question of the Immediate Future (Telephonfrage der Nächsten Zukunft). Karl v. Barth. A review of the rapid development in the use of the telephone, with illustrations of some of the latest large exchanges in Europe. Two articles. 7000 w. Elektrotech u Maschinenbau—July 1, 8, 1906. No. 78171 each D.

Transformer Efficiency of Telephonic Induction Coils, as Related to Long Distance Transmission. D. McL. Therrell. Describes an arrangement of circuits claimed to be particularly advantageous over long-distance aerial, telephone circuits. 2000 w. Elec Wld—June 30, 1906. No. 77758.

How to Improve Telephony. W. Duddell. Lecture before the Royal Inst. Presents some of the problems of telephony and the methods of measurement available. Diagrams. 2000 w. Elec Engr, Lond—Aug. 24, 1906. No. 78999 A.

Notes on the Development of Telephone Service. Fred De Land. A review of the history and development of the telephone. 7000 w. Pop Sci M—Nov., 1906. Serial. 1st part. No. 80064 C.

## DISTRIBUTION

## Cables

The Use of the Telephone in the Permanent Seacoast Defenses of the United States. M. C. Sullivan. Briefly calls attention to the changes due to the use of the telephone, and also explains the system of range-finding and fire-control used. 1000 w. Elec Rev, N. Y.—Oct. 6, 1906. No. 79636.

### Tele-Photography.

Long Distance Electric Photography (Elektrische Fernphotographie). Dr. Arthur Korn. A review of the methods which have been proposed for the transmission of portraits and autographs by electricity, with a special account of the recent successful operation between Munich and Nuremberg. 3500 w. Elektrotech Zeitschr—Dec. 14, 1905. No. 73859 B.

### Telharmony.

Electrical Music. Describes a system Proposed by Dr. Thaddeus Cahill for generating music at a central station and distributing it by means of wires, any distance, as loud as though the orchestra were on the spot. It is produced entirely by electrical apparatus. Ills. 2800 w. Sci Am—March 31, 1906. No. 75825.

The Generating and Distributing of Music by Means of Alternators. Illustrates and describes the electric music generating system of Dr. Thaddeus Cahill, which enables music to be heard, loud enough to fill the largest auditorium, at places many miles distant. 2000 w. Elec Wld—March 10, 1906. No. 75483.

### Testing.

American Practice in the Detection of Faults in Telephone Lines (Gebräuchliche Amerikanische Verfahren zur Bestimmung von Fehlern in Fernsprecheleitungen). Max Frein. Describing methods of testing and localizing faults by the use of Wheatstone bridge, using the methods of Murray and Varley. 3000 w. Elektrotech Zeitschr—April 19, 1906. No. 76850 B.

## DISTRIBUTION

### Accumulators.

Storage Batteries for Polyphase Currents (Anwendung von Pufferbatterien bei Drehstrom). L. Schroeder. Describing an improved arrangement of motor-generator with special shunt regulator, acting on the field of the direct current portion of the motor-generator. 3000 w. Elektrotech u Maschinenbau—April 15, 1906. No. 76846 D.

See Electrical Engineering, Electrochemistry

### Boosting.

A New Method of Automatic Boosting. Max J. E. Tilney. Abstract of a paper read before the Birmingham Loc. Sec. of the Inst. of Elec. Engrs. Describes a system of automatic regulation on the shunt field, dealing only with the apparatus as applied to boosters and batteries. Also discussion. 5000 w. Elect'n, Lond—Jan. 26, 1906. No. 74879 A.

### Cables.

Street Cable Systems. S. J. Watson.

# ELECTRICAL ENGINEERING

## Cables

Abstract of a paper read before the Manchester Loc. Sec. of the Inst. of Elec. Engrs. and of the discussion. Discusses the design and arrangement of both the draw-in systems and the solid systems, cost of construction, &c. 4800 w. Elect'n, Lond—Dec. 8, 1905. No. 73902 A.

The Manufacture, Application, and Distribution of Electric Cables for Collieries. George G. L. Preece. An illustrated article dealing exclusively with electric cables for colliery working. Describes various types of cable, considers the system and best form and method of erecting. 8800 w. Ir & Coal Trds Rev—Jan. 26, 1906. No. 74883 A.

Comments on Underground Cable Practice. Wallace S. Clark. Discusses the advisability of omitting metallic sheaths, and mentions other features of cable materials, and construction, and of tests. Gives specifications adopted by the Rubber-Covered Wire Engineers' Association. 2500 w. Am Inst of Elec Engrs—April 27, 1906. No. 76369 D.

Rubber Insulated Cables Without Lead. James S. McLean. Gives the writer's observations on the installation of non-leaded rubber-insulated cable, with reasons why the lead sheath is needed, and the care that should be given it. 1200 w. Elec Wld—May 26, 1906. No. 76978.

Constants for Calculating the Heating of Cables (Die Material Konstanten zur Berechnung der Kabel auf Erwärmung). J. Teichmüller und P. Humann. Deriving a formula for computing the increase in temperature of cables with especial reference to the empirical constants for various materials. 6000 w. Elektrotech Zeitschr—June 21, 1906. No. 78162 B.

The Laying of a 10000-Volt Cable. Dr. Alfred Gradenwitz. An illustrated article showing the recent operation of laying a 10000-volt cable in Germany. 700 w. Sci Am—June 30, 1906. No. 77708.

Discussion on "Standardizing Rubber-Covered Wires and Cables," and "Comments on Present Underground Practice," at New York, April 27, 1906, and at Minnesota Branch, May 4, 1906. 10500 w. Pro Am Inst of Elec Engrs—Aug., 1906. No. 79266 D.

Experimental Researches on the Heating of Cables by Three Phase Currents (Erwärmungsversuche mittels Drehstromes an Kabeln). Diagrams and tables of tests made by the Köln-Nippes cable works. 1800 w. Elektrotech Zeitschr—Aug. 30, 1906. No. 79357 B.

The Space Factor of Cables and Considerations Controlling Their Cost. H. M. Hobart. Aims to arrive at more

## DISTRIBUTION

tangible data from which to work out estimates of the cost of the high-tension transmission lines. 1700 w. Elec Engr, Lond—Sept. 14, 1906. Serial. 1st part. No. 79442 A.

### Connections.

Some Electrical Puzzlers. E. S. Lincoln. Explains puzzling cases occurring in the writer's experience. 1400 w. Power—June, 1906. No. 76749 C.

### Conductors.

An Improved System of Arranging Electrical Conductors (Eine Neue Verlegungsart für Leitungen). Ernst Kuhlo. Describing an improved form of metallic tube and connections for underground electric conductors. 2500 w. Elektrotech Zeitschr—Dec. 7, 1905. No. 73858 B.

Twin Flexibles. Donald Smeaton Monro. Notes on the uses and frailties of flexible cord conductors. 1700 w. Elec Rev, Lond—Nov. 24, 1905. No. 73594 A.

The Choice of an Insulated Cable. Wallace S. Clark. Discusses points of value in the selection of the most economical types. 4400 w. Cent Sta—Jan, 1906. No. 74280.

Overhead Wires or Cables? (Freileitung oder Kabel?) Louis Bernard. A tabular comparison of costs, both of construction and operation in a city distribution system for overhead wires and underground cables. 2500 w. Elektrotech u Maschinenbau—Aug. 19, 1906. No. 79361 D.

### Conduits.

Conduit Wiring for Electric Installations. L. M. Waterhouse. Abstract of a paper read before the Nat. Elec. Contractors' Assn., Lond. Discusses methods of conduit wiring, the materials, etc. 2000 w. Elec Engr, Lond—March 23, 1906. No. 75898 A.

The Long-Distance Underground Conduit System of the American Telephone and Telegraph Company between New York, N. Y., and New Haven, Ct. Illustrates and describes the recently completed conduit system from Stamford to New Haven, which connects with the previously built line to New York. The construction work is described. 1900 w. Elec Rev, N Y—April 14, 1906. No. 76053.

Electroliter and Conduit Hangers. Thomas W. Poppe. Discusses matters relating to conduit work in dwellings, giving diagrams. 900 w. Elec Wld—July 7, 1906. No. 77871.

### Control.

A New Method for the Automatic Control of Pressure and Insulation (Ueber ein Neues Verfahren zur Selbst-

## Control

# ELECTRICAL ENGINEERING

## Controllers

tätigen Spannungs und Isolationskontrolle). M. Kallmann. Discussing especially the testing and measuring of electrical signal apparatus. Two articles. 7500 w. *Elektrotech Zeitschr*—July 19, 26, 1906. No. 78749, each B.

A New Method of Controlling the Voltage and Insulation of a Network. Dr. M. Kallmann. Abstract translation from *Elektrotechnische Zeitschrift*. Describes apparatus which responds both to voltage fluctuations and to breakdowns of the insulation. 800 w. *Elect'n, Lond*—Oct. 12, 1906. No. 80052 A.

## Controllers.

Magnetic Switch Controllers on Electrically Operated Automatic Ore Unloaders at Lorain, O. R. I. Wright. Gives a brief description of the control equipment, with illustrations of some typical elements of the equipment. The unloaders are of the Hulett type. 1200 w. *Eng News*—Nov. 9, 1905. No. 73081.

## Converters.

"Permutators." Charles V. Drysdale. Describing a special form of rotary converter, in which the exciting field is produced by the primary current in a short-circuited magnetic core, instead of using an external magnet. 2300 w. *Elect'n, Lond*—Dec. 8, 1905. No. 73901 A.

## Currents.

The Limits of Alternating and Direct Currents for City Service (Die Grenzen der Verwendung von Drehstrom und Gleichstrom bei Stadtzentralen). Edmund Suchy. With formulas and diagrams showing the cost of distribution and the conditions which determine the choice of system. 2000 w. *Elektrotech u Maschinenbau*—Oct. 14, 1906. No. 79969 D.

Central Station Light, Heat and Power Principles. Newton Harrison. Explains phases of current, two-phase, three-phase, etc. 1500 w. *Cent Sta*—Sept., 1906. No. 79083.

## Detectors.

Ground Detectors and Their Connections. James T. Coe. Describes various types, with diagrams. 2500 w. *Am Elect'n*—Dec., 1905. No. 73568.

## Earthing.

Tests for Earthing (Erdungsprüfer). Dr. M. Corsepius. Describing apparatus and methods for testing the completeness of earthing connections for machinery, lightning arresters, and other electrical appliances. 1800 w. *Elektrotech Zeitschr*—Oct. 19, 1905. No. 73349 B.

## Faults.

Causes and Prevention of Faults on

## DISTRIBUTION

## Installation

Direct-Current Networks. F. Fernie. Observations referring to a direct-current three-wire network, with the neutral wire earthed at one place, and 460 volts between the outer wires. 2800 w. *Elect'n, Lond*—May 11, 1906. No. 76756 A.

## Fuses.

Zinc and Aluminium Fuses. Alfred Schwartz and W. H. N. James. An experimental examination of zinc and aluminium as materials for fusible cut-outs. 1200 w. *Elec Rev, Lond*—Nov. 17, 1905. Serial. 1st part. No. 73457 A.

Notes on the Standardization of Fuses. Alfred Schwartz. Considers the particulars in connection with which standardization would be advantageous. 2400 w. *Elec Rev, Lond*—Dec. 1, 1905. No. 73680 A.

Notes on Continental Systems of Fuse Standardization. Alfred Schwartz. Gives the principal points in connection with fuses contained in the official regulations, with remarks. 2000 w. *Elec Rev, Lond*—Dec. 15, 1905. No. 74046 A.

## Grounding.

Experience with Grounded Neutral in a High-Tension Plant. C. W. Ricker. Discusses the experience of the Interborough Rapid Transit Co., of New York. Also editorial. 4400 w. *Elec Jour*—Sept., 1906. No. 79265.

## Hamburg.

The Electric Distribution System of the City of Hamburg (Le Réseau de Distribution Electrique de la Ville de Hambourg). With plan of the city and plan and sections of the main generating station. 1500 w. 1 plate. *Génie Civil*—Oct. 21, 1905. No. 73311 D.

## Hospital.

Electricity in the London Hospital. An illustrated description of the electric light and power installation, comprising about 6,000 lights and 100 motors. 5000 w. *Elec Rev, Lond*—Nov. 10, 1905. No. 73282 A.

## House Service.

Electricity as a Home Comfort. J. D. Mackenzie. Considers some of the applications and discusses the design and the method of executing the work. 3000 w. *Elec Engr, Lond*—Dec. 15, 1905. Serial. 1st part. No. 74043 A.

## Installation.

The Installation of Electric Equipment from a Fire Insurance Point of View. C. W. Rohrer. The proper installation, the testing of materials, and the hazards of defective wiring are discussed, and the importance of inspection. 1800 w. *Cal Jour of Tech*—Sept., 1905. No. 74078 C.

# ELECTRICAL ENGINEERING

## Insulation

### Insulation.

Paper Versus Rubber Insulation for Electric Cables. W. I. Tamlyn. Discusses the cost, life, and electrical properties of the two kinds of insulation. 1600 w. Eng News—March 15, 1906. No. 75526.

Standardizing Rubber-Covered Wires and Cables. John Langan. Emphasizes the importance of using the best Para rubber, and gives tensile and other tests for determining it; and proposes a set of specifications for cables. 5000 w. Am Inst of Elec Engrs—April 27, 1906. No. 76368 D.

### Lines.

Line Construction for Overhead Light and Power Service. Paul Spencer. Discusses line construction, especially overhead construction; the safety and reliability of the lines and the sightliness of the construction. Ills. 4000 w. Can Elec News—Sept., 1906. No. 79189.

### London.

London's Power Supply. T. H. Minshall. Information concerning the present supply of electrical energy, and the proposed schemes, the relative cost of production, &c. 1400 w. Elec Wld & Engr—Dec. 9, 1905. No. 73668.

### Networks.

Computations for Equalization in Closed Networks (Die Ausgleichsrechnungen in Geschlossenen Leitungsnetzen). B. Soschinsky. A mathematical investigation based upon an improvement of the approximate method of Gauss. Two articles. 8000 w. Elektrotech Zeitschr—Nov. 23, 30, 1905. No. 73853 each B.

The Distribution of Pressure and Current Over Alternating-Current Circuits. A. E. Kennelly. Explains methods of computation. 3500 w. Harvard Engng Jour—Nov., 1905. Serial. 1st part. No. 73743 D.

### New Jersey.

Power Generation and Distribution on the System of the Public Service Corporation of New Jersey. The present number gives an illustrated description of the Marion (Hackensack River) station. 2000 w. St Ry Jour—Jan. 6, 1906. Serial. 1st part. No. 74226 C.

The Electrical Distribution System of the Public Service Corporation of New Jersey. G. U. G. Holman. The present number is principally a review of the history of this organization, and an account of the distribution problem. 2500 w. Elec Wld—Jan. 13, 1906. Serial. 1st part. No. 74436.

## DISTRIBUTION

### Oil-Switch.

The Ferrati New Three-Phase Remote-Control Oil-Switch. Describes the latest development of the oil breaking system. 1200 w. Sci Am Sup—March 31, 1906. No. 75832.

### Paris.

The Future Electrical Supply of Paris (Le Règime Futur de l'Electricité à Paris). J. Laverchère. A description of the present arrangement of generating stations and electrical distribution in Paris, and an account of the plans now under discussion for their extension. Two articles. 4000 w. Génie Civil—July 28, Aug. 4, 1906. No. 78721, each D.

### Power Distribution.

Distribution of Electrical Energy. John Francis Cleverton Snell. Historical review of progress, and a discussion of the prospects of a wider commercial use of electrical energy. Discussion. Ills. 38000 w. (No. 3522.) Inst of Civ Engrs. No. 73152 N.

Electricity and Sewage Disposal. Illustrated description of the high tension power distribution scheme of the Birmingham Tame and Rea District Drainage Board to pump sewage to a higher level. It is also used to drive motors at various places, lighting, etc. 2300 w. Elec Engr, Lond—Nov. 17, 1905. No. 73455 A.

The Distribution of Electricity in Mines. Deals with the types of cable that should be used in the various situations and the most satisfactory methods of installing them. 1800 w. Elec Engr, Lond—Oct. 27, 1905. Serial. 1st part. No. 73001 A.

### Rectifiers.

Some Observations on Alternating Current Rectifiers. A. C. Jolly. Considers briefly machines of the permutator type, and the electrolytic rectifier of the modern type. 1200 w. Elect'n, Lond—Oct. 12, 1906. No. 80050 A.

The Rectification of Currents by the Mercury Vapor Apparatus (Stromwandlung durch Quecksilber Vakuum Apparat). Arthur Libesny. Illustrating a variety of mercury-vapor tubes for the conversion of alternating into direct currents. Two articles. 5000 w. Elektrotech u Maschinenbau—Sept. 30, Oct. 7, 1906. No. 79967, each D.

Mercury Arc Rectifier for Charging Storage Batteries. A Frederick Collins. Illustrated description of the General Electric Co.'s mercury arc rectifier. 1200 w. Sci Am—Feb. 17, 1906. No. 75026.

## Rectifiers

# ELECTRICAL ENGINEERING

## Regulation

### Regulation.

The Regulation of the Pressure of Discharge of Lighting Batteries. Ernest P. Hollis and E. R. Alexander. Read before the Newcastle Sec. of the Inst. of Elec. Engrs. The booster method, and the regulating cell method are considered and compared. 2000 w. Elec Engr, Lond—May 18, 1906. Serial. 1st part. No. 76988 A.

### Relay.

A New Type of Reverse Current Relay. P. Mac Gahan and C. W. Baker. Describes this relay, and gives curves illustrating its performance. 1000 w. Elec Jour—Aug., 1906. No. 78603.

### Rotary Converters.

Some Notes on the Regulation of Rotary Converters. Alfred Still. Explains how compound winding of rotary converters enables the pressure across brushes to be maintained constant at all loads. 1400 w. Elec Rev, Lond—April 13, 1906. No. 76142 A.

### Rules.

Board of Trade Extra-High-Pressure Regulations. A copy of recently issued regulations under the Electric Lighting Acts, with editorial comment. 3000 w. Elect'n, Lond—April 27, 1906. No. 76505 A.

### Safety Devices.

Circuit Breakers Newton Harrison. Explains the function of the breaker, and gives a classification with respect to the direction and amount of current, and illustrates and describes types. 5000 w. Cent Sta—March, 1906. No. 75467.

Fuses. Dean Harvey. An illustrated article discussing their characteristics, standardization, and types. 2500 w. Elec Jour—March, 1906. No. 75629.

Notes on the American System of Fuse Standardization. Alfred Schwartz. Showing that both on the Continent and in America the fuse has received more attention than in England. 1800 w. Elec Rev, Lond—March 2, 1906. No. 75501 A.

The Operation of Circuit Breakers and Fuses. Prof. E. W. Marchant, and F. A. Lawson. A report of experiments made to determine exactly what size of fuse it was possible to have in series with a given circuit breaker to put it in action without blowing the fuse. 1200 w. Elect'n, Lond—March 2, 1906. No. 75503 A.

### Self Induction.

Oscillations of High Pressure and Frequency in Continuous-Current Circuits (Ueber Schwingungen mit Hoher Spannung und Frequenz in Gleichstrom-

## DISTRIBUTION

## Supply

netzen). C. Feldmann and J. Herzog. Showing how the self-induction of distributing cables may, under sudden changes, produce dangerous oscillations; thus accounting for breakdowns. Two articles. 10000 w. Elektrotech Zeitschr—Sept. 27, Oct. 4, 1906. No. 79955, each B.

### Southern France.

The Distribution of Electrical Energy in the Mediterranean Departments (Les Distributions d'Energie Electrique dans les Départements Voisins de la Méditerranée). A. Bidault des Chaumes. An account of the great electric generating stations in the South of France, and the distribution of energy on the Mediterranean littoral. Serial. Part 1. 2500 w. Génie Civil—Oct. 13, 1906. No. 79914 D.

### Substations.

Transformer Sub-Station at the St. Lazare Railway Station, Paris (Sous-Station de Transformation d'Energie Electrique de la Gare Saint-Lazare, Paris). J. Vinson. The primary current is supplied at 5000 volts and 25 cycles from the Molineaux generating station, and transformed to a continuous current at 125 volts for use in the railway terminal. 2000 w. 1 plate. Génie Civil—March 17, 1906. No. 76211 D.

Toronto Terminal Station of the Toronto & Niagara Power Company. Illustrates and describes what is said to be the largest sub-station in point of capacity in the world and is to receive 30,000 K. W. at about 60,000 volts from Niagara Falls. 2000 w. Can Elec News—June, 1906. No. 77335.

Some Interesting Features in the Design of a 3000 Kilowatt Sub-Station. S. J. Lisberger. Describes interesting features of sub-station No. 2, Oakland, Cal. Ills. 2700 w. Wis Engr—June, 1906. No. 76697 D.

The Boston Edison Company's Natick Station. Illustrates and describes interesting features of a station which supplies light and power to some seven or eight towns of Massachusetts, near Boston. 1200 w. Elec Wld—April 28, 1906. No. 76591.

See Street and Electric Railways.

### Supply.

The General Supply of Electricity for Power and Other Purposes: Its Commercial Character and Controlling Management. James N. Shoolbred. Discusses the cause of the backwardness of England in electrical development, offering suggestions for a remedy. Discussion. 6500 w. Jour Soc of Arts—May 25, 1906. No. 77123 A.

# ELECTRICAL ENGINEERING

## Switches

### Switches.

Improved Switch System for High Voltages in Mining Plants (Moderne Hochspannungs-Schaltanlagen für den Betrieb in Bergwerks-Anlagen). H. Mack. Especial attention is given to the prevention of ignition of mine gases; oil switches are described, and the general arrangement of underground installations. 1800 w. *Elektrotech Zeitschr*—Nov. 30, 1905. No. 73854 B.

Oil-Bath Switchgear. Leonard J. Pumphrey. Considers some of the points of a good oil for switch work. 1500 w. *Elec Rev*, Lond—Nov. 24, 1905. No. 73593 A.

Oils for High-Tension Switches. Jos. H. Bolam. Discusses the effect of the quality of the oil used in oil circuit-breakers; the essentials of a suitable oil; method of testing, etc. 1600 w. *Elect'n*, Lond—Aug. 3, 1906. No. 78548 A.

Automatic Oil Switches for High-Pressure Alternating Currents (Selbsttätige Hochspannungs Oelschalter für Wechselstrom). Karl Kuhlmann. A discussion of the advantages of oil switches made by the *Allgemeine Elektrizitäts Gesellschaft*. 4000 w. *Elektrotech Zeitschr*—Aug. 9, 1906. No. 79346 B.

### Three-Phase.

Simple Diagrams for Three-Phase Power Calculations. Alfred Still. Explains by the use of vector diagrams what is to be understood by the real and apparent power of the three-phase circuit under various conditions as regards load. 1500 w. *Power*—March, 1906. No. 75384 C.

### Three-Wire.

Balancers. Budd Frankenfield. A comparison of the direct-current motor generator and the alternating-current auto transformer. The comparison is limited to symmetrical three-wire systems of distribution or systems for which the voltages between either main and the neutral are approximately equal. 1500 w. *Elec Rev*, N. Y.—March 10, 1906. No. 75446.

Resistance Measurements in Three-Wire Systems with Unearthed Middle Wire (Die Bestimmung der Einzelurderstände in Dreileiternetze mit ungeerdetem Mittelleiter). Dr. E. Müllendorff. A discussion of the method of determining the resistance in multiple wire systems by comparing the voltages of the several wires. 1200 w. *Elektrotech Zeitschr*—May 24, 1906. No. 77648 B.

Notes on the "Middle Wire." A. Imbery. Notes on some methods of testing the three-wire system for distribut-

## DISTRIBUTION

## Transformers

ing electrical energy. 1000 w. *Elec Engr*, Lond—Aug. 3, 1906. No. 78547 A.

### Transformer House.

Switch and Transformer House for Brunots Island Power Station, Pittsburgh Railway Company. Illustrated description of a new transformer and switch house which serves the purpose of stepping up the pressure of the generating equipment for distribution. 2500 w. *Elec Ry Rev*—Aug., 1906. No. 78614.

### Transformers.

Switching System for the Reduction of Losses in Single and Polyphase Transformers when Operating Unloaded (Schaltungsanordnungen zur Vermeidung bezw. Verringerung der Leerlaufarbeit bei Ein und Mehrphasen-Wechselstromtransformatoren). J. Schmidt. Describing hand operated and automatic switches for the cutting out of transformers. Two articles. 7500 w. *Zeitschr f Elektrotechnik*—Oct. 22, 29, 1905. No. 73356 each D.

The Multiple Operation of Transformers. R. T. MacKeen. Discusses the principles involved in the multiple operation of transformers, thus showing how to accomplish the best results. 2000 w. *Can Elec News*—Nov., 1905. No. 73207.

Large Transformer Units for Power Distribution. J. N. C. Holroyde. Explains the work for which these large transformers are employed, and illustrates and describes types in use, methods of cooling, etc. 2000 w. *Elec Engr*, Lond—Jan. 26, 1906. Serial. 1st part. No. 74874 A.

Switching Arrangements for the Reduction of Losses in Single-Phase and Polyphase Transformers (Schaltungsanordnungen zur Vermeidung bezw. Verringerung der Leerlaufarbeit bei Ein und Mehrphasen Wechselstrom-Transformatoren). J. Schmidt. Discussing automatic switch devices for the control of current for transformers when running under light or no load. Serial. Part I. 2500 w. *Elektrotech u Maschinenbau*—May 6, 1906. No. 76849 D.

The Theory of Shop Methods of Testing Single and Polyphase Transformers. J. W. Rogers. Reviews facts connected with the working and the losses occurring in a transformer, and describes the tests generally carried out, giving diagrams. 2000 w. *Elec Engr*, Lond—May 4, 1906. Serial. 1st part. No. 76661 A.

Voltage Regulation in Transformer Stations (Spannungsregelung in Transformator Stationen). Heinrich Hinden. With graphical diagrams discussing the Tirrell regulator and the use of boosters for the maintenance of voltage. Two

# ELECTRICAL ENGINEERING

## Underground Mains

## DISTRIBUTION

## Wiring

articles. 7500 w. *Elektrotech Zeitschr*—April 26, May 3, 1906. No. 76853 each B. Transformers with Cooling Ribs (Transformator mit Kühlrippen). F. Niethammer. By the use of thin extended metallic ribs the radiating surfaces are increased, giving opportunity for air-cooling. 1200 w. *Elektrotech u Maschinenbau*—May 20, 1906. No. 77654 D.

Load and Power Factor Relations in Two-Phase to Three-Phase Transformers. F. A. Fish and Adolph Shane. Establishes by vector diagram the proof that on balanced secondary load the primaries of two-phase-three-phase transformer circuits are also balanced as to load and power factor. 600 w. *Elec Wld*—July 28, 1906. No. 78338.

## Underground Mains.

The Maintenance of Underground Mains. George L. Black. Abstract of a paper read before the Glasgow Sec. of the Inst. of Elec Engrs. A practical paper containing many useful hints. 3500 w. *Elect'n*, Lond—Jan. 12, 1906. No. 74517 A.

## Wales.

Electric Power Distribution in North Wales. Outlines the general features of this scheme and gives illustrated description of interesting details. The system is driven entirely by water power, and will transmit power over considerable distances at extra high pressure. 1200 w. *Elect'n*, Lond—Jan. 26, 1906. Serial. 1st part. No. 74877 A.

## Warehouse.

The Technical Arrangement of the Oberpollinger Warehouse in Munich (Die Technischen Einrichtungen des Kaufhauses Oberpollinger in München). Julius Weil. Details of the sub-station converters, illumination, elevator service, etc., of a department store in Munich. Nernst lamps are extensively used. 4500 w. *Elektrotech Zeitschr*—Oct. 26, 1905. No. 73350 B.

## Wind Pressure.

Wind Pressure on Cylindrical Conductors. A. J. Bowie, Jr. Gives an outline of the theory connected with the determination of K in the formula given, and of the methods employed in experimentally verifying these determinations. Also editorial. 2500 w. *Elec Wld*—Sept. 29, 1906. No. 79545.

## Wires.

Some Notes on Wires. Thomas Carter. Notes compiled for the purpose of comparing different wires available for electrical resistance of various types. 1000 w. *Elec Rev*, Lond—March 30, 1906. No. 76004 A.

## Wiring.

Lead-Covered Wiring. John D. MacKenzie. Presents the advantages and disadvantages of this system, showing how some of the disadvantages may be minimized. 2000 w. *Elec Rev*, Lond—Nov.

Exposed Circuit Wiring. Louis J. Auerbacher. An illustrated article giving directions for the proper execution of the work, and information in regard to materials. 1600 w. *Elec Wld*—Jan, 1906. No. 74312.

The Electric Wiring of Small Buildings during Course of Erection. R. Robson. Read before the Newcastle Sec. of the Inst. of Elec. Engrs. Considers the means of getting a good installation at small expense, especially in small dwellings. 4000 w. *Elec Engr*, Lond—Feb. 9, 1906. No. 75060 A.

Wiring with Wooden Mouldings. Louis J. Auerbacher. An illustrated article giving suggestions for the selection of material and laying out of the work, and the proper methods of executing. 2000 w. *Elec Wld*—Feb. 3, 1906. No. 74907.

Conduit Wiring for Electric Installations. Abstract of a paper read before the Elec. Contractors' Assn. Reviews the practice of electric wiring, discussing the various conduits used and methods of installing. 3000 w. *Elect'n*, Lond—March 2, 1906. No. 75504 A.

Electrical Conduit Work in Fireproof Buildings. Thomas W. Poppe. Illustrated discussion of the best methods. 1000 w. *Elec Wld*—March 3, 1906. No. 75359.

Residence Wiring. Louis J. Auerbacher. Gives sample specification for a four-story and basement house having wooden floors and partitions, with analysis, and detailed description of apparatus. 4500 w. *Elec Wld*—March 3, 1906. No. 75358.

The Slide Rule as a Substitute for the Wire Table. Carl P. Nachod. Outlines methods for resistance calculations which are extremely rapid, yet accurate. 900 w. *Elec Wld*—March 3, 1906. No. 75357.

Notes on Wiring with Lead-Covered Rubber Insulated Wire. Presents the advantages of this system, comparing with other systems in use. Ills. 1500 w. *Elec Rev*, Lond—April 20, 1906. No. 76437 A.

Consumers' Installations. A. E. Woodhouse. Read before the Elec. Assn. of Victoria. Discusses the efficiency and protection from fire and shock in the wiring of buildings. 2200 w. *Aust Min*



# ELECTRICAL ENGINEERING

## Accumulators

Stand—May 16, 1906. Serial. 1st part. No. 77468 B.

Points on Central Station Wiring. W. Barnes, Jr. Considers the importance of wiring, methods of tinning terminals and cables, location of cables, conduits, etc. Ills. 1500 w. Elec Jour—July, 1906. No. 78034.

What Degree of Accuracy is Feasible and Necessary in Wiring Calculations. Albert Scheible. A discussion of the probable errors in wiring computations, and their influence upon each other; with examples. 3500 w. Jour W Soc of Engrs—Aug., 1906. No. 78889 D.

Wiring and Lighting Equipment of an

## ELECTRO-CHEMISTRY

## Accumulators

Eight-Room \$3,500 Residence. J. R. Cravath. Extracts from a paper read before the Ohio Elec. Lgt. Assn., outlining a number of plans. 3500 w. Elec Wld—Sept. 1, 1906. No. 78977.

A New Method of Employing Twin Lead-Covered Wire for Electric Light Wiring. E. L. Berry. Calls attention to the defects in metal tube, and in wood casing, and suggests a substitute which is illustrated and described. 3000 w. Elec Engr, Lond—Sept. 28, 1906. No. 79688 A.

Uniform Symbols for Wiring Plans. Gives the symbols adopted by the National Electrical Contractors' Association of the United States. 600 w. Eng News—Oct. 11, 1906. No. 79722.

## ELECTRO-CHEMISTRY

### Accumulators.

Accumulators without Lead Plates (Ueber Nichtbleiakкумуляtoren). Dr. Karl Elbs. A discussion of the chemical reactions in storage batteries of the Edison and Jungner type, using an alkaline electrolyte and plates of other metals than lead. 1000 w. Zeitschr f Elektrochemie—Oct. 27, 1905. No. 73360 G.

Accumulator without Lead Plates (Ueber Nichtbleiakкумуляtoren). Dr. Gräfenberg. Discussing the operative conditions of the nickel-iron battery, giving curves, showing the discharging pressures. 1500 w. Zeitschr f Elektrochemie—Oct. 27, 1905. No. 73361 G.

Electric Storage Battery Engineering. J. Lester Woodbridge. Gives the points of difference between a dynamo and a storage battery, and discusses the character of the work the storage battery is best fitted to perform; also the characteristics of the storage battery and its auxiliary apparatus, its care, &c. 4500 w. Cassier's Mag—Nov., 1905. No. 72991 B.

A Novel Storage Battery. Dr. Alfred Gradenwitz. Describes a novel accumulator being brought out in Germany in which the two electrodes are made of lead and zinc peroxide. 1200 w. Am Elect'n—Dec., 1905. No. 73563.

Some Points Relating to Storage Batteries and Boosters. L. Brockman. Read before the Dublin Sec. of the Inst. of Elec. Engrs. Discusses features of present-day cells, their function and management, and various types of boosters and the work for which each is suited. 7000 w. Elec Engr, Lond—Dec. 15, 1905. No. 74045 A.

The Chemical Composition of the Nickel Oxide Electrode in the Jungner-Edison

Accumulator (Ueber die Chemische Zusammensetzung der Nickeloxyd-Elektrode im Jungner-Edison-Akkumulator). Julian Zedner. An examination of the chemical nature of the active material in the Edison storage battery. 2000 w. Zeitschr f Elektrochemie—Nov. 17, 1905. No. 73867 G.

The Edison Iron-Nickel Accumulator. M. U. Schoop. Translated from the *Elektrotechnische Zeitschrift*. An illustrated article giving data and test results of a cell experimented with by the writer. 7700 w. Sci Am Sup—Dec. 23, 1905. Serial. 1st part. No. 73989.

Secondary Cells: Their Deterioration and the Causes. G. D. Aspinall Parr. Abstract of a paper read before the Leeds Loc. Sec. of the Inst. of Elec. Engrs. Considers impurities present in cells in small quantities are the chief cause of unsatisfactory working and deterioration, and reports experiments designed to support the statement. 2000 w. Elect'n, Lond—Dec. 29, 1905. No. 74292 A.

Storage Batteries and Their Application to Public Institutions. Frank Cawter. Abstract of a paper read before the Engrs. -in-Charge. Discusses methods of charging, and the changes that take place during the phenomena of charge and discharge, and various practices and their effects. Elect'n, Lond—Jan. 12, 1906. No. 74519 A.

Chemical and Physical Reactions of the Nickel Oxide Electrode in the Alkaline Accumulator (Ueber das Chemisch. und Physikalische Verhalten der Nickel-Ox- yd-Elektrode im Jungner-Edison-Akkumulator). Julian Zedner. Data and results of experimental investigations in the laboratory of the university of Göttingen. 5000 w. Zeitschr für Elektrochemie—July 6 1906. No. 78172 D.

# ELECTRICAL ENGINEERING

## Anodes

The Alkaline Accumulator (Der Alkalische Akkumulator). Dr. Max Roloff. A study of the chemical reactions in the Edison alkaline storage battery. 4000 w. Elektroteck u Maschinenbau—June 17, 1906. No. 78169 D.

The Lines of Current in Storage Batteries—An Experimental Study. M. U. Schoop. Describes a method which permits studying, with relatively simple means, the distribution of the lines of current in electrolytes with sufficient exactness for all practical purposes. 3000 w. Elec-Chem & Met Ind—July, 1906. Serial. 1st part. No. 77918 C.

Premier Accumulator Tests. Report of Dr. R. T. Glazebrook on a complete series of tests carried out at the National Physical Laboratory on this type of cell. 600 w. Elec Rev, Lond—Aug. 24, 1906. No. 79002 A.

## Anodes.

Truswell's Anode Mold. R. Truswell. Illustrated description of a new mold developed for the purpose of casting anodes. 700 w. Engr & Min Jour—May 5, 1906. No. 76547.

## Battery.

The Decker Primary Battery. Prof. Francis B. Crocker. Read before the Am. Elec.-Chem. Soc. Remarks on the little progress made in batteries, and their defects, and an illustrated description of the battery named, which the writer considers a remarkable advance in the primary battery art. 3500 w. Sci Am Sup—Oct. 13, 1906. No. 79756.

## Batteries.

Arrangement of Battery Cells. George M. Hopkins, in "Experimental Science." An explanation of the method of connecting batteries to secure the greatest efficiency. Diagrams. 1000 w. Sci Am Sup—June 16, 1906. No. 77290.

## Bleaching.

Flour Bleaching with the Aid of Electricity. Brief illustrated description of apparatus used in this novel application of electricity. 800 w. Elect'n, Lond—June 8, 1906. No. 77378 A.

## Cadmium Cell.

The Cadmium Standard Cell. George A. Hulett, in the *Physical Review*. A study of these cells giving results. 3500 w. Serial. 1st part. No. 79457 A.

## Calculations.

Electrochemical Calculations. Joseph W. Richards. Developing formulas for the values of electrical energy in thermal and mechanical units for the expression of the effects of electrical currents. 3500 w.

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## Cyaniding

Serial. Part I. Jour Frank Inst—Feb., 1906. No. 75094 D.

## Carborundum.

The Carborundum Furnace. F. A. J. Fitzgerald. With longitudinal and transverse sections of the electric furnace for the production of silicon carbide, and a discussion of the efficiency of its operation. 1700 w. Electrochem & Met Ind—Feb., 1906. No. 74910 C.

## Cells.

Mercurous Sulphate and Standard Cells. G. A. Hulett, in the *Physical Review*. Experimental investigations to determine the best method of preparing the mercurous sulphate and the depolarizer for standard cells. 4800 w. Elect'n, Lond—Aug. 17, 1906. No. 78848 A.

## Colloids.

Colloids and Their Utilization. An explanation of the term, with some of the technical applications of colloids. 3800 w. Engng—July 6, 1906. No. 77978 A.

## Corrosion.

The Corrosion of Iron Electrodes by Earth Currents. F. Haber and F. Goldschmidt. Abstract translation. Considers the problem from the electrochemical side. 1200 w. Elect'n, Lond—Sept. 28, 1906. No. 79668 A.

The Effect of Earth Return Current on Iron Pipes. Considers the experiments being carried out in Germany by Messrs. Haber and Goldschmidt, as reported in the *Zeitschrift für Elektrochemie und E. T. Z.* Gives the conclusions reached. 1400 w. Elec Rev, Lond—Sept. 21, 1906. No. 79575 A.

## Current Density.

The Rôle of Current Density in Electrolytic and in Electric Furnace Processes. Discusses the rôle of current density in each case, and shows the necessity of watching it and adjusting it to the needs of the moment. 2000 w. Elec-Chem & Met Ind—Feb., 1906. No. 74908 C.

## Cyaniding.

Studies in the Electrolytic Separation of Gold from Cyanide Solutions (Studien zur Elektrolytischen Fällung des Goldes aus Cyanidlösungen). Dr. B. Neumann. A review of practical experience, with diagrams showing results for various current-densities and solutions. 4000 w. Zeitschr f Elektrochemie—Aug. 10, 1906. No. 79365 G.

The Electrolytic Deposition of Gold from Cyanide Solutions. Editorial review on a paper by Prof Bernh. Neumann, describing investigations made to determine the current efficiency from solutions of different concentration;

# ELECTRICAL ENGINEERING

## Electric Furnaces

whether a high or low current was the more economical and whether other electrodes than lead and iron could be used. 1200 w. *Elect'n, Lond*—Aug. 24, 1906. No. 79005 A.

## Electric Furnaces.

Electric Furnaces. J. H. Stansbie. Abstract of a paper read before the Birmingham (Eng.) Electric Club. Brief illustrated descriptions of some simple forms of electric furnaces which can be readily fitted up for experimental purposes. 1400 w. *Elec Engr, Lond*—Nov. 10, 1905. No. 73279 A.

An Electrical Steel-Furnace. Gustave Gin. Abstract of a paper read at meeting of the Am. Elec-Chem. Soc. Gives plan and sections of furnace, with description. 1000 w. *Eng & Min Jour*—Nov. 11, 1905. No. 73106.

The Gin Electric Furnaces (Fours Electriques Gustave Gin). G. Dary. Illustrated description of the electric furnaces for refining steel, and for producing vanadium and its alloys, as exhibited at Liège. 2500 w. *L'Electricien*—Nov. 11, 1905. No. 73364 B.

The Gin Electric Steel Furnace. Frank C. Perkins. Illustrates and describes this electric furnace for metallurgical purposes. 1000 w. *Min Wld*—Oct. 20, 1906. No. 80013.

The Ruthenburg and Acheson Furnaces. F. A. J. FitzGerald. Describes the working and explains the theory of these furnaces. 2000 w. *Elec-Chem & Met Ind*—Nov., 1905. No. 73070 C.

Electrically-Heated Carbon-Tube Furnaces. Abstract of a paper by R. S. Hutton and W. H. Patterson before the Faraday Soc. Deals with electric furnaces constructed with a carbon tube through which an electric current is passed. Ills. 1400 w. *Elec-Chem & Met Ind*—Dec., 1905. No. 73723 C.

Potential Regulation for Large Electric Furnaces. H. R. Stuart. Considers methods for regulating the current supplied to electric furnaces, and the devices used. Ills. 1500 w. *Elec Jour*—April, 1906. No. 76354.

Structural Changes in Nickel Wire at High Temperatures. H. C. H. Carpenter. Read before the British Assn. Illustrated account of research work to ascertain the reason for a fundamental change in the mechanical properties of nickel wire used as the heating-coil of an electrically-heated porcelain tube-furnace. Plates. 4000 w. *Engng*—Aug. 17, 1906. No. 78852 A.

The Electric Furnace: Its Evolution, Theory and Practice. Alfred Stansfield. Gives the history of the electric furnace,

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## Electric Smelting

with general description and classification, its efficiency, cost, design, construction, operation, uses, etc. Ills. 3500 w. *Can Engr*—May, 1906. Serial. 1st part. No. 76624.

New Experiments on Formation of Diamond in Electric Furnace. Prof. Henri Moissan. A report of an experimental study. 1600 w. *Sci Am Sup*—Sept. 8, 1906. No. 79081.

## Electric Smelting.

Electric Smelting of Magnetite Ores: Successful Experiments at Sault Ste Marie. An address delivered by Dr. Eugene Haavel before the Canadian Club, Toronto, on March 12, 1906. An account of the experimentation on Canadian ores at the Soo, giving illustrated description of the electric furnace. The results are pronounced successful. 3800 w. *Can Engr*—April, 1906. No. 75923.

Electric Furnace Methods of Iron and Steel Production. John B. C. Kershaw. Introductory review of what has been accomplished in this field, to be followed by articles dealing with the furnaces and processes now used in the electric production of iron and steel. Ills. 1300 w. *Ir Trd Rev*—June 28, 1906. Serial. 1st part. No. 77516.

Electrical Steel Melting at Disston Plant. Illustrations of the induction type of electric furnace used at this plant, near Philadelphia, which manufactures saws and tools. 1000 w. *Ir Age*—June 7, 1906. No. 77150.

Some Laboratory Experiments with Electric Furnace. J. W. Evans. An illustrated description of experiments, and of furnaces used. 1200 w. *Can Min Rev*—June, 1906. No. 77362 B.

Electric Smelting of Iron Ore. Abstract of Dr. Eugene Haanel's official preliminary report on the experiments made at Sault Ste. Marie, Ont. 3800 w. *Elec-Chem & Met Ind*—July, 1906. No. 77917 C.

Electric Smelting of Iron Ore. Phillips Thompson. Remarks on the results obtained by Dr. Eugene Haanel in the Sault Ste. Marie experiments. 1600 w. *Eng & Min Jour*—July 7, 1906. No. 77846.

The Electrothermal Metallurgy of Iron. Major E. Stassano. Gives a résumé of the present position of electrothermal metallurgy, describing two types of furnace, and giving results of experiments. Ills. 6800 w. *Elect'n, Lond*—Sept. 7, 1906. No. 79222 A.

See Mining and Metallurgy, Iron and Steel.

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## Electrode

### Electrode.

A Simple Form of Rotating Electrode for Electrochemical Analysis. F. Mollwo Perkin. Read before the Faraday Soc. Describes a cathode, readily constructed in the laboratory, and gives some results obtained with it. 900 w. Elect'n, Lond—June 15, 1906. No. 77481 A.

### Electrolysis.

Alternate-Current Electrolysis as Shown by Oscillograph Records. W. R. Cooper. Read before the Faraday Soc. Reviews briefly recent views on this subject, and gives a report of experimental investigations, giving records obtained by a double oscillograph. 1800 w. Elec Engr, Lond—Nov. 3, 1905. No. 73127 A.

Alternating - Current Electrolysis? S. M. Kintner. Illustrated description of a test made under as nearly service conditions as possible, showing the action to be very slight. 1000 w. Elec Jour—Nov., 1905. No. 73407.

Electrolysis with Alternating Currents (Elektrolyse mit Wechselstrom). Dr. Max Le Blanc. Discussing especially the action of alternating currents upon complex solutions. 2000 w. Zeitschr f Elektrochemie—Oct. 27, 1905. No. 73358 G.

The Electrolysis of Water. Joseph W. Richards. Divides the subject into its experimental, its theoretical, and its applied phases, treating each in detail. Ills. 5000 w. Jour Fr Inst—Nov., 1905. No. 73098 D.

The Theory of Electrolytic Dissociation (Versuch einer Theorie der Elektrolytischen Dissociation). R. Malmström. A mathematical examination of the theory of Jahn and Nernst upon the weakening of a strong electrolyte by dissociation taking into account the electrical energy of the ions. 5000 w. Zeitschrift f Elektrochemie—Nov. 17, 1905. No. 73866 G.

Electrolysis of Dilute Solutions of Acids and Alkalis at Low Potentials: Dissolving of Platinum at the Anode by a Direct Current. George Senter. Read before the Faraday Soc. A report of experimental investigations, with conclusions. 3500 w. Elect'n Lond—July 20, 1906. No. 78298 A.

Electrolysis by Alternating currents. Reviews some researches in this field, commenting on the results. 1500 w. Am Gas Lgt Jour—Jan. 22, 1906. No. 74481.

### Electrolytes.

Factory Scale Experiments with Fused Electrolytes. Edgar A Ashcroft. Deals with special lines of practical electrolytic work with which experimental trials have been conducted on a scale comparable to

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factory conditions. Ills. 3000 w. Elec Chem & Met Ind—April, 1906. Serial. 1st part. No. 76028 C.

### Electroplating.

Platinum Plating and Its Execution. Gives results of experiments which show that platinum may be deposited as easily as gold. 1400 w. Brass Wld—Oct., 1906. No. 80068.

The Production of Hard Gold Deposits for Buffed Work. Gives methods of obtaining a hard deposit that will stand buffing. Ills. 1500 w. Brass Wld—Oct., 1906. No. 80069.

### Electro-Metallurgy.

Electrometallurgy in 1905. John B. C. Kershaw. A review of the year's progress in the electrometallurgical industries. 1400 w. Eng & Min Jour—July 28, 1906. No. 78279.

Electro-Metallurgy in 1905. A survey of the progress in the various branches of electro-metallurgy in 1905. 2000 w. Engr, Lond—Jan. 26, 1906. Serial. 1st part. No. 74886 A.

Electro-Technical Industries, Reviews the achievements in the electric-metal-lurgical field during the last half-dozen years. 1800 w. Sci Am Sup—March 31, 1906. No. 75831.

The Electrolytic Deposition of Zinc Using Rotating Electrodes. T. Slater Price and G. H. B. Judge. Read before the Faraday Soc. A summary of the results thus far obtained in an investigation of the deposition of zinc from solutions of zinc sulphate, making use of a rotating cathode. 2000 w. Elect'n, Lond—July 6, 1906. No. 77970 A.

### Electrothermics.

Electrothermics of Iron and Steel. Ch. A Keller. Abstract of a paper read before the Faraday Soc. Gives results obtained in 1905 in the production of iron and steel by the electric furnace at the Livet Works, France. 1500 w. Ir & Coal Trade Rev—April 13, 1906. No. 76311 A.

### Electrotypes.

Rapid Methods for Producing Electrotypes. Sherard Cowper-Coles. An illustrated description of methods for this work used in Europe and America. 1600 w. Elec Rev, Lond—June 15, 1906. Serial. 1st part. No. 77476 A.

### Furnaces.

An Electric Furnace for Heating Crucibles. Oliver P. Watts. Illustrates and describes a type of experimental furnace used in melting on a considerable scale moderately refractory metals, such as iron, and chromium. 2000 w. Elec-Chem & Met Ind—July, 1906. No. 77919 C.

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## Galvanizing

Vertical Arc Furnaces for the Laboratory. Samuel A. Tucker. Gives plan and elevation of an arc furnace consisting essentially of a Moissan furnace of graphite, arranged vertically. 900 w. Elec Chem & Met Ind—July, 1906. No. 77916 C.

## Galvanizing.

Cold Galvanizing. Illustrated description of the electrolytic process and apparatus employed by the U. S. Electro-Galvanizing Company. 2500 w. Ir Age—June 21, 1906. No. 77406.

Electrolytical Galvanizing. Henry I. White. Report of mechanical and chemical tests in proof that steel and iron articles coated by the Electrolytical process are superior to those galvanized by the hot process in their resistance to both mechanical and atmospheric action. 1800 w. Ir Age—Jan. 18, 1906. No. 74433.

## Graphite.

The Manufacture of Graphite and Amorphous Carbon (Die Technische Gewinnung von Graphit und Amorphem Kohlenstoff). E. Donath. Discussing especially the reactions involved in the production of graphite by Acheson, in the electric furnace. 4000 w. Stahl u Eisen—Oct. 15, 1906. No. 79947 D.

## Hypochlorites.

Some Observations Respecting the Relation of Stability to Electro-Chemical Efficiency in Hypochlorite Production. W. Pollard Digby, before the Faraday Soc. Reports results of tests which show that no test of the efficiency of any apparatus for the electrolytic productions of the hypochlorites can be regarded as complete without an estimation of losses through instability, and a mention of the volume of the contents of the electrolyzing tank. 1800 w. Elec Engr, Lond—Nov. 24, 1905. No. 73591 A.

The Production of a Disinfectant (Hypochlorite of Sodium) by Electrolysis. C. V. Biggs. Discusses the possibility of rendering the process a commercially successful one. 800 w. Elec Engr, Lond—Dec. 22, 1905. No. 74141 A.

The use of Electrolytic Hypochlorite as a Sewage Sterilizing Agent in the United Kingdom. John B. C. Kershaw. Gives details of the hypochlorite cells which have been patented and worked in the United Kingdom. Ills. 2700 w. Elec Chem & Met Ind—April, 1906. No. 76025 C.

## Industries.

The Electrochemical and Electrometallurgical Industries in 1906. John B. C. Kershaw. Gives details of the present position in these industries, with interest-

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## Nitrogen

ing illustrations. 5500 w. Cassier's Mag—May, 1906. No. 76484 B.

## Ions.

The Mobility of Ions Produced by the Nernst Lamp (Sur la Mobilité des Ions Produits par la Lampe Nernst). L. Bloch. A record of studies of the electric field surrounding the glow of a Nernst lamp. 1800 w. Comptes Rendus—July 3, 1906. No. 78723 D.

## Iron.

The Electrometallurgy of Iron and the Iron Alloys (Electrometallurgie des Eisens und der Eisenlegierungen). J. Hess. A review of the practical methods of smelting iron and refining steel by electrical processes. Serial. Part I. Zeitschr f Elektrochemie—Jan 12, 1906. No. 74663 G.

## Laboratory.

Laboratory of Applied Electro-Chemistry at Columbia University. Prof. Samuel A. Tucker. Illustrated description of laboratory for the study of practical electro-chemistry, and for research work and some of the appliances used. 1500 w. Elec-Chem & Met Ind—May, 1906. No. 76427 C.

## Niagara.

The Niagara Falls Electro-Chemical and Metallurgical Industry. Frank C. Perkins. The first of a series of articles describing the power-plants and distribution. 1000 w. Min Wld—June 2, 1906. Serial. 1st part. No. 77090.

## Nickel Plating.

A Serviceable Black Nickel Solution. Frank Noir. Gives the black nickel solution found satisfactory by the writer, and directions for operating it. Ills. 1500 w. Brass Wld—Aug., 1906. No. 79493.

## Nitrogen.

The Electric Production of Nitrates from the Atmosphere. Prof. Silvanus P. Thompson. A lecture at the Royal Inst. Explains and demonstrates the ingenious process for the "fixation" of nitrogen devised by Prof. Birkeland and developed with the assistance of Herr Eyde, giving figures of cost, and showing its industrial importance. 6800 w. Elect'n, Lond—Feb. 9, 1906. No. 75062 A.

The Utilization of Atmospheric Nitrogen (Utilisation de l'Azote Atmosphérique). A Boileau. A review of the various electro-chemical methods which have been proposed for the fixation of atmospheric nitrogen for the production of ammonia and nitrates. 1800 w. Génie Civil—Jan. 20, 1906. No. 75112 D.

Fixation of Atmospheric Nitrogen. Prof. Philippe A. Guye. Slightly

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## Nitrogen

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## Nitrogen

abridged paper read before the Swiss Soc. of Nat. Science. A summary of the application of modern principles of physical chemistry to the combustion of nitrogen. Also editorial. 5000 w. *Elec Chem & Met Ind*—April, 1906. No. 76026 C.

The Fixation of Atmospheric Nitrogen. Editorial discussing the importance of nitrogen in the household of nature; its chief sources, and what has been accomplished in utilizing the stores of the atmosphere. 3800 w. *Engng*—Jan. 19, 1906. No. 74-750 A.

Electro-chemistry and the Problem of the Fixation of Atmospheric Nitrogen (*La Fixation de l'Azote et l'Electrochimie*). Philippe A. Guye. A study of the methods of fixation of atmospheric nitrogen showing the problem to be one of electro-chemistry and dependent upon the low cost of electrical energy. 4000 w. *Rev. Gen. d'Sciences*. Jan. 15, 1906. No. 75768 D.

The Artificial Production of Nitrates from the Atmosphere. Gives views of the factory in Notodden, Norway, where nitrate lime is being manufactured by the Birkeland and Eyde process, with information concerning the work. 1300 w. *Engr*, Lond—March 16, 1906. No. 75801 A.

The Production of Nitric Acid by Explosive Combustion (*Darstellung von Salpetersäure mittels Explosibler Verbrennung*). Hr. Häuser. Describing a scheme for producing nitric acid by the explosive combustion of nitrogen and oxygen by the electric spark in the cylinder of a gas engine; thus utilizing the power of the explosion. 3500 w. *Zeitschr d Ver Deutschr Ing*—Feb. 24, 1906. No. 75707 D.

The Utilization of Atmospheric Nitrogen (*Utilization de l'Azote Atmospherique*). E. Lemaire. A review of the electrical methods for the fixation of atmospheric nitrogen. Serial, Part I. 3000 w. *Génie Civil*—March 10, 1906. No. 75718 D.

Southern Water-Powers and Fertilizer. C. H. Z. Caracristi. Deals with the process of obtaining nitrogen from the atmosphere, reviewing the papers by Sir William Crookes and Professor Sylvanus P. Thompson, and the work at the factory in Norway. 5500 w. *Mfrs Rec*—April 12, 1906. No. 76043.

Producing Fertilizer from the Atmosphere. William Herbert Hobbs. Describes an industry established about 50

miles north of Rome, Italy, for "fixing" the atmospheric nitrogen in a form suitable for plant food. 1200 w. *Min Wld*—June 2, 1906. No. 77091.

Artificial Production of Nitrate of Lime by Electric Discharge. John B. C. Kershaw. Remarks on the processes of different experimenters, giving a brief illustrated description of the method of Messrs. Birkeland and Eyde. 1500 w. *Elec Wld*—July 21, 1906. No. 78204.

On the Oxidation of Atmospheric Nitrogen in Electric Arcs. K. Birkeland. Read before the Faraday Soc. On the progress recently made with regard to the oxidation of atmospheric nitrogen, indicating its possible future advances, and describing the Birkeland-Eyde process. Ills. 2500 w. *Elec Engr*, Lond—July 6, 1906. Serial. 1st part. No. 77968 A.

The Electro-Chemical Problem of the Fixation of Nitrogen. Prof. Philippe A. Guye. Read before the Soc. of Chem. Ind. Slightly condensed. Deals especially with the commercial side of the question. 3000 w. *Elect'n*, Lond—July 13, 1906. Serial. 1st part. No. 78206 A.

Technical Methods for Utilizing Atmospheric Nitrogen (*Technische Methoden zur Verarbeitung des Atmosphärischen Stickstoffes*). W. Muthmann. A review of the development of electrical methods for the fixation of atmospheric nitrogen, with details of the Birkeland & Eyde process. A bibliography is appended. 5000 w. *Zeitschr d Ver Deutschr Ing*—July 28, 1906. No. 78707 D.

The Fixation of Atmospheric Nitrogen. H. Leicester Greville. A brief discussion of this subject and of the agricultural value of the product, concluding that only the future can determine the commercial success of the recent researches. 1800 w. *Jour of Gas Lgt*—Aug. 7, 1906. No. 78575 A.

The Present Technical Methods for the Oxidation of Nitrogen (*Ueber die bisherigen Technischen Versuche der Stickstoffverbrennung*). Dr. F. Foerster. A review of the various attempts at the fixation of atmospheric nitrogen, with especial reference to the Birkeland-Eyde process. 4500 w. *Zeitschr f Elektrochemie*—Aug. 3, 1906. No. 78759 G.

The Utilization of Atmospheric Nitrogen. H. Leicester Greville. Discussing the influence it may have on sulphate of ammonia sales. 1000 w. *Jour of Gas Lgt*—July 24, 1906. No. 78375 A.

The Electrical Fixation of Atmospheric Nitrogen (*Die Darstellung von Stickstoff-Sauerstoff Verbindungen aus Atmosphär-*

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## Oxygen

ischer Luft auf Elektrischem Wege). Dr. O. Kausch. A critical review of the various patents since 1902. 3500 w. *Elektrochemische Zeitschr*—Aug., 1906. No. 79366 G.

The Birkeland-Eyde Process and the Artificial Production of Nitrates from the Atmosphere. M. Alger. Illustrates and describes the plant in Norway, for removing nitrogen from the atmosphere by electrical processes for the purpose of employing it as a fertilizer. 900 w. *Sci Am*—Oct. 6, 1906. No. 79633.

The Fixation of Atmospheric Nitrogen. Gives abstracts of the papers on this subject presented at the Dresden meeting of the German Bunsen Society. 3000 w. *Engr*, Lond—Sept. 21, 1906. No. 79590 A.

## Oxygen.

The Liquefaction of Air and Processes of Separating Oxygen (Ueber Luftverflüssigungs und Sauerstoffgewinnungs Verfahren). Rudolf Mewes. A review of the thermodynamics of the liquefaction of air, with reference to the commercial production of oxygen. Serial. Part 1. 3000 w. *Elektrochemische Zeitschr*—Sept., 1906. No. 79367 G.

## Ozone.

Recent Devices for the Production of Ozone (Neue Apparate zur Erzeugung von Ozon). Dr. Kausch. A general review of recent patents, with especial reference to water purification. Serial. Part I. 800 w. *Elektrochemische Zeitschr*—Dec., 1905. No. 74664 G.

An Improved Ozone Generator. Charles H. Coar. An explanation of what ozone is, and a brief account of its discovery, with illustrated description of an improved generator. 1800 w. *Sci Am*—Sept. 29, 1906. No. 79500.

## Progress.

Electro-Chemical and Electro-Metallurgical Progress in 1905. F. S. Spiers. Reports steady and satisfactory progress in both industries, discussing the developments. 2200 w. *Elec Rev*, Lond—Feb. 16, 1906. Serial. 1st part. No. 75273 A.

## Refining.

Electro-Chemical Refining of Copper. Birger Carlson. Translation of an important paper by a Swedish metallurgist, giving an impartial comparison of the multiple system and the series system in the electrolytic refining of copper, as carried on in the United States. 3500 w. *Min Jour*—Jan. 20, 1906. No. 74742 A.

Electro-Technical Industries. George E. Walsh. Calls attention to the effect of electrometallurgy on the manufacture and refining of articles of commerce, copper

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## Zinc

refining, artificial graphite, and the use of the electric furnace in various industries, etc. 1800 w. *Sci Am*—Jan. 20, 1906. No. 74438.

## Review.

The Progress of Electrochemistry in the Past 25 Years (*Progrès de l'Electrochimie dans ces Derniers 25 Ans*). C. D. Koubitzki. A review of the results following the work of Arrhenius, and the development of the theory of ions. 3000 w. *Revue Technique*—Nov. 10, 1905. No. 73837 D.

Electrochemistry and Electrometallurgy in 1905. Charles F. Burgess. Reviews the standing of the industries, the new products, the value of the electric furnace, etc. 2500 w. *Elec Rev*, N. Y.—Jan. 13, 1906. No. 74431.

## Scrap.

Electrical Recovery of Scrap Metal. George E. Walsh. Information concerning the increasing use of the electric current for recovery works. 2200 w. *Min Wld*—May 26, 1906. No. 76980.

## Slags.

A New Apparatus to Determine the Melting Points of Slags. Woolsey McA. Johnson. Illustrated description of the apparatus and its use. 700 w. *Elec-Chem & Met Ind*—July, 1906. No. 77915 C.

## Smelting.

Preliminary Report on the Smelting of Magnetic Iron Ore by Electricity. Preliminary report submitted by Dr. David, T. Day on the subject of smelting by electricity the magnetic iron ores obtained from various points on the Pacific beach. 1200 w. *Min Rept*—Dec. 28, 1905. No. 74111.

Electric Lead Smelting. Anson G. Betts. A report of experiments with the Betts-Valentine process, describing the process and giving results. Also editorial. 6000 w. *Elec Chem & Met Ind*—May, 1906. No. 76426 C.

## Sugar Analysis.

Electro-Decolorization—A Study in Optical Sugar Analysis. F. G. Wiechmann. Abstract of an address before the Int. Com. for Uniform Methods of Sugar Analysis, at Berne, Switzerland. A report of experiments made. 3000 w. *Elec-Chem of Met Ind*—Oct., 1906. No. 79657 C.

## Zinc.

Electro-Metallurgy of Zinc. Erminio Ferraris. Read before the 6th Int. Cong. of Ap. Chem. Reviews what has been accomplished in the development of the thermo-electric zinc industry. 1200 w. *Min Jour*—June 16, 1906. No. 77471 A.

# ELECTRICAL ENGINEERING

## Alternating Waves

### Alternating Waves.

The Effect of Iron in Distorting Alternating-Current Wave Form. Frederick Bedell and Elbert B. Tuttle. A theoretical study of the harmonics introduced by iron into the current wave, particularly the third harmonic, and the hysteresis loop of the iron to which these harmonics are due. Curves and tables. 3500 w. *Am Inst of Elec Engrs*—Sept. 28, 1906. No. 79508 D.

### Atmospheric Electricity.

Telluric Currents. Reviews an article by M. Guarini to the Belgian Astronomical Society upon telluric currents, their origin, direction, their disadvantages and their possible utilization. 2400 w. *Sci Am Sup*—Nov. 18, 1905. No. 73206.

### Analogies.

Analogies Between Light and Electric Waves.—Braun's Experiments. Prof. B. Dessau, in *Umschau*. Reviews some experimental studies of the electro-magnetic theory of light, especially the experiments of Braun. 1200 w. *Sci Am Sup*—March 3, 1906. No. 75322.

### Commutation.

Commutation Theory. A. Press. Mathematical discussion leading to working rules for preventing sparking at brushes. 800 w. *Elec Wld & Engr*—Dec. 16, 1905. No. 73923.

Notes on Commutation and Pole-Changing (Einiges über Kommutation und Wendepole). E. Arnold. A review of the discussions of Müller and of Pichelmayer, deriving formulas for computing the effects of commutation. 3000 w. *Zeitschr f Elektrotechnik*—Nov. 26, 1905. No. 73862 B.

### Condensers.

High Tension Electric Condensers (Les Condensateurs Electriques à Haute Tension). A. Schoenenberger. Describing the Moscicki condensers, made of glass tubes coated with electrically deposited silver. 2000 w. *Bull Tech de la Suisse Rom*—Nov. 10, 1905. No. 73878 D.

### Conductivity.

On the Electric Conductivity of a Vacuum. J. A. Fleming in *Technics*. An account of experimental investigations showing that certain conditions change the results, and giving facts explaining the phenomena, and a general study of the subject. 4000 w. *Sci Am Sup*—Jan. 20, 1906. No. 74444.

### Currents.

Idle Currents. M. B. Field. Abstract of paper read before the Manchester Sec. of the Inst. of Elec. Engrs. Considers

## ELECTRO-PHYSICS

## Electric Waves

the losses from idle currents in main conducting circuits. 2700 w. *Elec Engr*, Lond—Feb. 23, 1906. No. 75367 A.

### Definitions.

Voltage. Voltage-Difference, Potential Potential-Difference, Electromotive Force (Spannung, Spannungsdifferenz, Potential, Potentialdifferenz, Elektromotorische Kraft). Fritz Emde. A mathematical examination of electric potential relations, deriving critical definitions in accordance with the notation of the vector analysis. 4000 w. *Zeitschr f Elektrotechnik*—Dec. 10, 1905. No. 73865 B.

### Discharges.

High-Potential Discharges. A. Frederick Collins. A review of disruptive discharges in their application to wireless telegraphy, and connective discharges in their relation to the human body. Ills. 1500 w. *Sci Am*—Jan. 27, 1906. No. 74571.

The Electric Spark. Dr. G. A. Hemsalech in the *La Science au XXme Siècle*. An illustrated article considering only sparks produced by the discharge of condensers through air at ordinary atmospheric pressure. 5000 w. *Sci Am Sup*—Jan. 27, 1906. No. 74575.

Recent Investigations Upon the Mechanism of the Disruptive Discharge (Recherches, Recente sur le Mécanisme de la Décharge Disruptive). M. Langevin. An examination of disruptive electrical discharges in the light of the electron theory, showing their bearing upon the study of the nature of electricity. 7000 w. *Bull Soc Int des Electriciens*—Feb., 1906. No. 75760 G.

### Earth Currents.

Report of the Commission of the German Gas and Water Companies for the Investigation of Earth Currents. Gives results of recent work. 1300 w. *Elect'n*, Lond—July 20, 1906. No. 78297 A.

### Eddy Currents.

An Investigation of Eddy Currents in Sheet Iron (Beitrag zur Untersuchung der Wirbelströme in Eisenblechen). A. Kühns. Data and results of tests upon sheets of various thicknesses to determine eddy-current coefficients for use in Steinmetz's formula. 5000 w. *Elektrotech Zeitschr*—Sept. 27, 1906. No. 79956 B.

### Electric Waves.

The Use of the Wehnelt Interrupter with the Righi Exciter for Electric Waves. A. D. Cole in the *Physical Review*. Describes the method of using the Wehnelt interrupter, and its application to demonstration purposes. Ills. 2000 w. *Elect'n*, Lond—Oct. 19, 1906. No. 80134 A.



# ELECTRICAL ENGINEERING

## Electrical Discharge

### Electrical Discharge.

The Electrical Discharge in Air, and Its Commercial Application. Sidney Leatham and William Cramp. Read before the British Assn. A report of investigations, describing the construction and application of the apparatus developed, the electrical phenomena involved, and the chemical phenomena. Ills. 7800 w. Elec Engr, Lond—Aug. 24, 1906. No. 78996 A.

### Electrical Oscillations.

The Effect of Electrical Oscillations on Iron in a Magnetic Field. W. H. Eccles. Abstract of a paper read before the Physical Soc. Reports investigations of the action of high-frequency oscillations upon iron held magnetized in a magnetic field. 2000 w. Elect'n, Lond—Aug. 24, 1906. No. 79006 A.

### Electromagnets.

Easy Method of Approximating Magnet Windings. Charles R. Underhill. Describes a graphic system, giving charts and citing actual cases to facilitate following the methods employed. 900 w. Am Elect'n—Dec., 1905. No. 73565.

Test of a Valve Magnet. C. P. Nachod. Gives a test on a magnet, showing the effect which the position of the magnetizing coil with respect to the working air-gap has on the pull produced. 400 w. Elec Wld & Engr—Dec. 23, 1905. No. 74029.

The Approximate Calculation of Plunger Electromagnets. Charles R. Underhill. Shows graphically the relation between pull, area, ampere-turns, and length of air-gap, or stroke of plunger, with mathematical explanation. 400 w. Elec Wld & Engr—Dec. 16, 1905. No. 73925.

### Electromotive Force.

Generation of E. M. F. by Centrifugal Force. E. F. Nichols. Translated from *Phys. Zeit.* An account of experimental investigations giving results which show that the positive ions are not the chief carriers of the electric current in aluminum. 1400 w. Elect'n, Lond—Oct. 19, 1906. No. 80135 A.

### Electrons.

Mechanical Technical Discussions (Mechanisch-Technische Plaudereien). Dr. G. Holzmüller. A review of the latest electrical theories, with especial reference to the theory of electrons. Two articles. 7500 w. Zeitschr d Ver Deutschr Ing—Jan. 20, 27, 1906. No. 75101 Each D.

### Flux Distribution.

Notes on the Distribution of the Magnetic Flux in Direct-Current Machines with Commutating Poles. F. R. Pohl. An explanation of the distribution of the

## ELECTRO-PHYSICS

commutating flux considering unloaded machines and armature reaction. Ills. 2500 w. Elec Engr, Lond—April 20, 1906. No. 76435 A.

Flux-Distribution in Machines with Commutating Poles. Thomas F. Wall and Stanley P. Smith. Experimental investigations are described and discussed. 1500 w. Elect'n, Lond—April 6, 1906. No. 76074 A.

### Gravitation.

The Problem of Gravitation. Charles Morris. A study presenting briefly some of the hypotheses which have been offered in explanation. 5500 w. Jour Fr Inst—Feb., 1906. No. 75093 D.

### Harmonics.

The Utility of Methods of Avoiding Harmonics in Alternating-Current Machinery (Sur l'Utilité et les Moyens d'Eviter les Harmoniques dans les Appareils à Courants Alternatifs). F. C. Guéry. An exhaustive study of harmonic action in high-tension alternating-current circuits, showing how such action may be checked at its inception. 9000 w. Bull Soc Ind des Electriciens—March, 1906. No. 76267 G.

A New Method of Decomposing a Periodical Curve into its Harmonics (Eine Neue Methode zur Zerlegung einer Periodischen Kurve in Ihre Harmonischen). K. H. Haga. Describing a graphical method of analyzing the curves of alternating currents, and similar oscillations. 1200 w. Elektrotech u Maschinenbau—Sept. 23, 1906. No. 79964 D.

### High Tension.

Simple Experiments with Currents of High Tension and Frequency. Thomas R. Hopper. Describes a few examples of simple experiments which can be performed with inexpensive apparatus. 1400 w. Sci Am Sup—Feb. 17, 1906. No. 75029.

### Hysteresis.

Comparative Investigations upon Linear and Rotary Magnetic Hysteresis (Vergleichende Untersuchungen über Lineare und Drehende Magnetische Hysteresis). Dr. W. Wecken. A review of previous work, with data and results of the author's investigations on steel and on wrought and cast iron. 4500 w. Zeitschr f Elektrotechnik—Nov. 5, 1905. No. 73357 B.

Magnetic Hysteresis (L'Hysteresis Magnetique). P. Duhem. A study of the phenomena of magnetization in fields of varying intensity, and a discussion of the consequent effects of hysteresis. Two articles. 7500 w. Rev Gen d Sciences—Jan. 15, 30, 1906. No. 75767 each D.

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## Induction

The Hysteresis Exponent Experimentally Determined. E. L. Weber. Gives an experimental method of determining the value of the hysteresis exponent in a choking coil, or transformer, of closed magnetic circuit. 500 w. *Elec Wld*—Sept. 29, 1906. No. 79547.

## Induction.

Standards of Mutual Induction. G. F. C. Searle, and J. R. Airey. Explains the method of calculating the coefficient of mutual induction to any desired degree of accuracy, when the secondary coil lies inside the primary coil. 3500 w. *Elect'n, Lond*—Dec. 8, 1905. No. 73903 A.

Self Induction or Armature Reaction (Selbstinduktion oder Ankerrückwirkung?) Hermann Zipp. A discussion of the theory of Peukert, considering the secondary circuits of continuous and alternating currents. 2000 w. *Elektrotech Zeitschr*—May 3, 1906. No. 76856 B.

Induction Between Two Parallel Wires. George D. Shepardson. Explains methods of calculating the induction between parallel wires. 2300 w. *Engrs' Soc Univ of Minn*—Year Bk, 1906. No. 77510 N.

On the Electric Inductive Capacities of Dry Paper and of Solid Cellulose. Albert Campbell. Read before the Royal Soc. Reports tests made on samples of paper obtained from four different cable manufacturers, describing methods of testing. 2500 w. *Elect'n, Lond*—Aug. 31, 1906. Serial. 1st part. No. 79133 A.

Effects of Self-Induction in an Iron Cylinder. Ernest Wilson. Read before the Royal Soc. An examination of what goes on in an iron cylinder when electric currents are reversed in it, and maintained steady after reversal. 1600 w. *Elect'n, Lond*—July 20, 1906. No. 78299 A.

## Insulation.

The Influence of Polish upon the Insulating Properties of Wood (Einfluss der Politur auf die Isolierenden Eigenschaften von Holz). Karl Wernicke. A discussion of experiments, showing that polishing does not materially affect the insulating properties of wood. 1500 w. *Elektrotech Zeitschr*—May 17, 1906. No. 76860 B.

## Interrupters.

A Study of Interrupters (Sur les Eclateurs). R. de Valbreuze. A general review of the development of modern interrupters, with especial reference to the production of Hertzian waves for space telegraphy. 10000 w. *Bull Soc Int d Electriciens*—Nov., 1905. No. 73868 F.

## Iron Losses.

Devices for Determining the Energy

## ELECTRO-PHYSICS

Losses in Iron Sheets. Dr. Alfred Gra-denwitz. Illustrates and describes testing apparatus of various types for making a magnetic examination of iron. 1000 w. *Sci Am Sup*—June 23, 1906. No. 77423.

Iron Losses in Alternating Current Commutator Motors (Die Eisenverluste von Wechselstrom-Kommutatormotoren). Dr. Niethammer. A study of hysteresis and eddy-current losses in alternating motors, with formulas and diagrams for practical use. 2000 w. *Elektrotechnik und Maschinenbau*—June 10, 1906. No. 77657 D.

## Laboratory.

The National Physical Laboratory, Bushey House. Illustrated description of the new electrotechnical building, with an account of the newer work of the laboratory and its recent developments, especially in electrical matters. 1100 w. *Elec Rev, Lond*—June 22, 1906. Serial. 1st part. No. 77779 A.

## Lightning.

Lightning and the Electricity of the Air. Alexander G. McAdie. Reviews the investigations of Franklin and his co-laborers in this field, and of later investigations to the present time, discussing the protection from lightning and related subjects. 1150 w. *Jour of Elec*—March, 1906. No. 75471 C.

## Liquid Films.

The Disruptive Voltage of Thin Liquid Films Between Iridio-Platinum Electrodes. P. E. Shaw. Read before the Physical Society. An account of research work, explaining methods used and results. 3500 w. *Elect'n, Lond*—Oct. 5, 1906. No. 79800 A.

## Magnet Coils.

Graphical Determination of the Dimensions of Magnet Coils. C. Kinzbrunner. Gives curves used for the determination of the dimensions, explaining how they are obtained. 900 w. *Elec Engr, Lond*—March 2, 1906. No. 75498 A.

## Magnetic Field.

An Investigation into the Periodic Variations in the Magnetic Field of a Three-Phase Generator by Means of the Oscillograph. G. W. Worrall and T. F. Wall. Abstract of a paper read before the Manchester Sec. of the Inst. of Elec. Engrs. A report of investigations made to obtain experimental records of the variations referred to under various conditions of load. 1100 w. *Elect'n, Lond*—April 13, 1906. No. 76194 A.

The Production of a Rotary Magnetic Field Considered Graphically. A graph-

# ELECTRICAL ENGINEERING

## Magnetic Induction

ical proof of the fundamental theorem which underlies the principle of action of the production of rotary magnetic fields. 1200 w. *Elec Engr*, Lond—Sept. 28, 1906. No. 79685 A.

Some Phenomena of Single-Phase Magnetic Fields. B. G. Lamme. Gives costs and methods of analyzing the single-phase field, furnishing a simple explanation of certain characteristics of single-phase machinery. 2400 w. *Elec Jour*—Sept., 1906. No. 79264.

The Rotating Magnetic Field. R. E. Hellmund. A discussion of the nature of rotating magnetic field, its distribution, and the pole faces, its speed of rotation, etc. Considers in detail a threephase motor with one slot per pole per phase in both members. 2800 w. *Elec Rev*, N Y—Sept. 22, 1906. No. 79415.

## Magnetic Induction.

Limitations of the Ballistic Method for Magnetic Induction. A. Hoyt Taylor, in the *Physical Review*. Reports an investigation of discrepancies found, with a view to determining their quantitative effect on cyclic curves of magnetization, and of devising a means of eliminating them. 1800 w. *Elect'n*, Lond—Oct. 5, 1906. No. 79798 A.

## Magnetism.

Magnetic Properties of Electrolytic Iron. C. F. Burgess and A. Hoyt Taylor. A preliminary report on work in progress, giving an account of tests made, and discussing the results. 2200 w. *Pro Am Inst of Elec Engrs*—July, 1906. No. 78355 D.

## Magnets.

Characteristic Performance of Polyphase Magnets. D. L. Lindquist. An investigation of the influence exerted by the coil resistance and also the external resistance. Ills. 2000 w. *Elec Wld*—Sept. 22, 1906. No. 79475.

Method of Design for Magnet Windings. F. Albert Willard. Outlines methods which may be used in the design of any winding, and if followed closely will give accurate results. 800 w. *Elec Wld*—April 21, 1906. No. 76184.

Polyphase Magnets. D. L. Lindquist. Gives an outline of the features which should be embodied in the construction of polyphase magnets. 1000 w. *Elec Wld*—July 21, 1906. No. 78205.

Alternating-Current Magnets. D. L. Linquist. Gives a brief review of direct-current magnets in order to afford a comparison, and a description of the general features of magnets for alternating current, discussing the general principles of the theory. 2000 w. *Elec Wld*—June 23, 1906. Serial. 1st part. No. 77465.

## ELECTRO-PHYSICS

### Oscillations.

Phase-Shifted High-Frequency Oscillations. Prof. Ferdinand Braun. Gives abstract translation of an article on phase-displacement measuring, published in *Physikalische Zeitschrift*. Considers phase displacement by ohmic resistance, and by resonance. Ills. 4000 w. *Elect'n*, Lond—Jan. 19, 1906. No. 74740 A.

The Influence of the Armature Slots upon the Oscillations of Alternators (Ueber die Entstehung und Form von Oberschwingungen durch die Zähne der Wechselstromdynamos). Dr. K. Simons. An examination of the form and phase of the excess oscillations taken in connection with the relation of the armature slots to the poles. 1800 w. *Elektrotech Zeitschr*—July 5, 1906. No. 78167 B.

### Radioactivity.

Induced Radioactivity Excited in Air at the Foot of Waterfalls. J. C. McLennan. Read before the Am. Phys. Soc. An account of experimental investigations made of Niagara Falls, describing apparatus, experiments, &c. 3800 w. *Sci Am Sup*—Nov. 4, 1905. No. 72970.

The Diminution of the Radio-Activity of Polonium with the Lapse of Time, (Sur la Diminution de la Radioactivité du Polonium avec le Temps) Mme. Curie. Deriving an exponential equation for the rate of diminution, with experimental values for the constant. 1500 w. *Comptes Rendus*—Jan. 29, 1905. No. 75117 D.

The Duration of the Discharge in an X Ray Tube (Sur la Durée de la Décharge dans un Tube à Rayons X). André Broca. Description of experimental demonstration that the duration of the discharge is about 0.0005 second. 1000 w. *Comptes Rendus*—Jan. 29, 1906. No. 75116 D.

The Heating Effects Produced by Röntgen Rays in Different Metals, and Their Relation to the Question of Changes in the Atom. H. A. Bumstead. An account of experimental investigations, describing the apparatus used and giving results and conclusions. 7500 w. *Am Jour of Sci*—Jan, 1906. No. 74178 D.

The Present Position of Radioactivity. Frederick Soddy. Abstract of presidential address to the Röntgen Society. 5500 w. *Elect'n*, Lond—Jan. 5, 1906. No. 74408 A.

Cathode Rays in a Magnetic Field (Les Rayons Cathodique dans le Champ Magnetique). P. Villard. A study of the behaviour of the corpuscles in magnetic fields of various intensities and distribution. 7000 w. 4 Plates. *Bull Soc Int des Electriciens*—Feb. 1906. No. 75759 G.

# ELECTRICAL ENGINEERING

## Rectifier

The Radio-Activity of Thorium Minerals and Salts. Bertram B. Boltwood. Describes experiments undertaken with the object of determining what proportion of the total  $\alpha$ -ray activity of radio-active minerals was produced by the thorium present, and whether the activity due to thorium was in all cases proportional to the actual amount of this element contained in the mineral. 4500 w. Am Jour of Sci—June, 1906. No. 77157 D.

The Radio-Activity of Thorium. H. M. Dadourian. Read before the Am. Phys. Soc. Describes experiments undertaken to determine the quantitative relation between the thorium activity of various minerals and separated salts, and their content of thorium. 2200 w. Am Jour of Sci—June, 1906. No. 77158 D.

The Radio-Activity of the Salts of Radium. Bertram B. Boltwood. A report of experimental investigations with general results and conclusions. 1800 w. Am Jour of Sci—June, 1906. No. 77156 D.

The Relation Between the Radio-Activity and the Composition of Thorium Compounds. H. N. McCoy and W. H. Ross. A study of compounds and minerals containing thorium; with or without uranium. 3000 w. Am Jour of Sci—June, 1906. No. 77159 D.

The Present Status of the Electrotechnics of the Röntgen Rays (Ueber den Heutigen Stand der Röntgen Elektrotechnik). J. F. Koch. Describing improved induction coils, Crookes tubes and apparatus for X-ray work. 5000 w. Elektrotech Zeitschr—July 26, 1906. No. 78751 B.

## Rectifier.

The Rectification of Alternating Currents. P. Rosling. Abstract of a paper read before the Leeds Loc. Sec. of the Inst. of Elec. Engrs. and of discussion. Explains the operation of the electrolytic rectifier and the mercury arc rectifier. 3500 w. Elect'n, Lond—Feb. 9, 1906. No. 75063 A.

## Resistance.

Brush-Contact Resistance. K. C. Nandi. An account of some experiments made at the Glasgow University. 600 w. Elec Engr, Lond—Jan. 5, 1906. No. 74403 A.

## Resistivity.

The Resistivity Temperature-Coefficient of Copper. Dr. A. E. Kennelly. Shows a short and simple computation made with the aid of a given table. 400 w. Elec Wld—June 30, 1906. No. 77757.

## Resonance.

Resonance with Imperfect Condensers (Resonanz bei Unvollkommenen Kon-

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densatoren). Dr. Gustav Benischke. An examination of the losses in condensers as actually used, showing that they are due to imperfections in the dielectrics. 2500 w. Elektrotech Zeitschr—July 26, 1906. No. 78750 B.

A Resume of Electrical Resonance. Frank F. Fowle. Describes the occurrence of resonance and the conditions that cause it, its uses and dangers. 1500 w. Elec Rev, N Y—May 19, 1906. Serial. 1st part. No. 76723.

## Self Induction.

Self-Induction Effects in Steel Rails. Ernest Wilson. An account of experimental investigations, with results. 2800 w. Electn, Lond—Feb. 23, 1906. No. 75365 A.

## Singing Arc.

Theory of the Singing Arc. H. T. Simon. Abstract from the *Physikalische Zeitschrift*. An explanation of the theory and the deductions drawn. 800 w. Elect'n, Lond—July 27, 1906. No. 78471 A.

## Sparks.

The Heating Effect of the Electric Spark. Henry A. Perkins. A report of research work, with conclusions. Also editorial. 3000 w. Elec Wld—March 24, 1906. No. 75691.

## Thermo-Electricity.

Recent Investigations upon Thermo-Electric Substances (Neuere Beobachtungen an Thermoelektrischen Wirkenden Körpern). A. Heil. Describing the author's improvements in thermo-electric batteries, and their application to the utilization of the heat of waste gases. 3000 w. Elektrotech Zeitscher—Oct. 4, 1906. No. 79960 B.

## Transformer.

Simple Transformer for Amateur Use. Edmund S. Smith. Describes and illustrates a small transformer easily built by any one familiar with tools, at a cost of about \$3.50 for materials. 1000 w. Sci Am Sup—Feb. 17, 1906. No. 75028.

## Waves.

Wave Shapes in Three-Phase Transformers. R. C. Clinker. A study of the wave distortion produced in star-connected three-phase transformers, as shown by use of the Hospitalier ondograph. Editorial. 2000 w. Elect'n, Lond—Nov. 10, 1905. No. 73283 A.

## Windings.

Methods of Winding for the Generation of Harmonic Electromotive Forces (Ueber Einige Wicklungsanordnungen zur Erzeugung Harmonischer Elektromotorischer Kräfte). Chr. Bäumlér. A

# ELECTRICAL ENGINEERING

## Accidents

mathematical discussion of the influence of coil windings upon the wave form of

## GENERATING STATIONS

## Alternators

the currents generated. 4000 w. Elektrotech Zeitschr—Sept. 20, 1906. No. 79952 B.

# GENERATING STATIONS

## Accidents.

Accidents with Electrical Machinery. Remarks from the report of Mr. Scott Ram., Electrical Inspector of Factories, on the causes and means of prevention of electrical accidents. 3000 w. Mech Engr—July 28, 1906. No. 78464 A.

## Accumulators

Economic Considerations in the Employment of Storage Batteries. J. R. Salter. Abstract of paper and discussion before the Manchester Soc. of the Inst. of Elec. Engrs. Discusses the advantages claimed, and concludes that they are not justified by the cost at which they are obtained. Also editorial 5500 w. Elect'n, Lond—April 6, 1906. No. 76075 A.

Maximum efficiency of a Storage Battery. Benjamin F. Bailey. Describes a test made to get the highest possible efficiency from a storage battery. The experiments showed a quantity efficiency of almost 100 per cent, and a watt-hour efficiency of 91.8 per cent. 700 w. Elec Wld—April 21, 1906. No. 76186.

See Electrical Engineering, Electrochemistry.

## Alternators.

The Dick Kerr Alternator for Steam Turbine Drive. Illustrated description of a new alternator for steam-turbine speeds. 900 w. Elect'n, Lond—Nov. 24, 1905. No. 73595 A.

The Influence of Armature Reaction upon the Wave Form of Alternators (Der Einfluss der Ankerrückwirkung auf die Wellenform von Wechselstrommaschinen). Dr. G. Benischke. A study of the causes of variation of wave forms from the true sine curve. 3000 w. Zeitschr f Elektrotechnik—Nov. 19, 1905. No. 73861 B.

A Note on the Calculation of the Armature Reaction of Alternators. Waldo V. Lyon. A discussion showing the assumptions that must be made to calculate the armature reaction as it is ordinarily done. Considers first a single-phase alternator, and then a three-phase machine. 3000 w. Tech Qr—Dec., 1905. No. 74588 E.

A Self-Exciting Alternator. E. F. Alexanderson. Illustrated description of an electric generator with rectifying commutator and automatic voltage regulation by three-phase field rheostat. 3500 w. Pro

Am Inst of Elec Engrs—Jan., 1906. No. 74762 D.

The Wiring and Connection of Alternators. G. A. Burnham. An illustrated explanation of the three classes of alternators; the revolving armature, the revolving field, and the inductor type. 1600 w. Engr, U S A—Jan. 15, 1906. No. 74478 C.

The Design of Alternators, with Reference to Voltage Variations (Die Dimensionierung der Wechselstrommaschinen mit Rücksicht auf Spannungsänderung). W. Wittek. Deriving formulas for the dimensions of the various details of alternators for given conditions of efficiency and temperature. 2500 w. Elektrotech u Maschinenbau—Feb. 4, 1906. No. 75144 D.

Johannesburg Alternators. Illustrated description of some large alternate-current dynamos of the two-phase type, for coupling with gas-engines which run at 100 r. p. m. Reports their trial. 1000 w. Elec Engr, Lond—March 16, 1906. No. 75669 A.

Inductor Alternators. E. S. Hawkins. Considers the advantages of the inductor construction, and explains the operating principle. Ills. 1200 w. Engr, U S A—June 1, 1906. No. 77082 C.

A 120,000-Period Alternator. Emile Guarini. Illustrated description of this high-frequency alternator, showing some of the difficulties encountered in its construction. 1500 w. Sci Am Sup—July 7, 1906. No. 77830.

Heat Tests on Alternators. Sebastian Sensius. Gives a series of methods developed as substitutes for full-load heat-tests. 2500 w. Pro Am Inst of Elec Engrs—June, 1906. No. 78042 D.

"Image Current" Alternators. G. Facioli. A description of an alternator excited by low frequency currents whose armature reaction is compensated by image or reflected currents flowing internally in the machine. Also editorial. Ills. 2500 w. Elec Wld—July 14, 1906. No. 77962.

The Self-Synchronizing of Alternators. Morgan Brooks and M. K. Akers. Explains a method of using coreless inductances for safe synchronizing of alternators. 2000 w. Pro Am Inst of Elec Engrs—June, 1906. No. 78047 D.

Arrangement for the Automatic Parallel Running of Alternators (Vonieh-

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## Armatures

tung zum Selbsttätigen Parallelschalten von Drehstrommaschinen). Dr. Gustav Beniske. Describing an automatic starter for enabling alternators to be started in step. 2000 w. Elektrotech u Maschinenbau—July 22, 1906. No. 78, 756 D.

The Engineer's Part in Paralleling Alternators. W. T. Fernandez. Explains the principle of parallel operation of alternators, and the method of control. 900 w. Power—Aug., 1906. No. 78325 C.

Self-Exciting, Low-Frequency Alternator. G. Faccioli. Discusses an interesting self-exciting generator devised by William Stanley, giving an outline description. Also editorial. 4500 w. Elec Wld—Sept. 15, 1906. No. 79247.

The Sudden Short-Circuiting of Alternators. F. Punga. A study of the factors that effect the difference between a gradual short circuit and a sudden short circuit. Gives an approximation to that which actually happens. 2700 w. Elect'n, Lond—Aug. 31, 1906. No. 79132 A.

Alternating Current Generators. P. M. Lincoln. Notes on their construction, performance and operation. Ills. 1200 w. Elec Jour—Oct., 1906. Serial. 1st part. No. 79894.

## Armatures.

Finding Faults in a Direct Current Armature. Adolph Shane, in *The Iowa Engineer*. Explains methods of especial interest for small plants. 1000 w. Engr, U S A—Dec. 1, 1905. No. 73617 C.

Winding of Direct-Current Armatures. A. C. Jordan. A detailed description of the various operations performed by an armature winder. Ills. 2500 w. Elec

The Distribution of Magnetic Induction and Hysteresis Loss in Armatures. Dr. W. M. Thornton. Read before the Newcastle Loc. Sec. of the Inst. of Elec. Engrs. A study of magnetic distribution, analysing the results. Ills. 1400 w. Elec Engr, Lond—March 9, 1906. Serial, 1st Part. No. 75592 A.

Putting on a Direct-driven Generator Armature. H. L. Strong. Explains the writer's experience in the first attempt to force on the armature of a small-sized generator. 900 w. Power—June, 1906. No. 76748 C.

Series Parallel Armature Windings with Equipotential Connections. Prof. E. Arnold. The present number considers the design of series parallel windings, the action of equipotential connections, and the particular conditions for

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equipotential connections with slotted armatures. 3000 w. Elect'n, Lond—June 15, 1906. Serial. 1st part. No. 77478 A.

Series-Parallel Armatures with Equipotential Connections (Reihenparallelanker mit Alquipotential verbindungen). E. Arnold. With computations for the windings, and tables to aid in determining the connections. 6000 w. Electrotech Zeitschr—July 5, 1906. No. 78166 B.

The Estimation of the Temperature Rise of Armatures. A. Press. Showing the necessity for taking into account sparking at the commutator, as well as the relations between the commutator and armature losses. 500 w. Elec Wld—June 30, 1906. No. 77754.

Construction of Squirrel-Cage Armatures. A. G. Ellis. Illustrated detailed description of the design and construction, giving methods employed on various types. 2700 w. Mech Engr—Aug. 18, 1906. No. 78837 A.

Predetermination of the Length of Armature Conductors. A. I. M. Weintraub. Mathematical demonstration. 500 w. Elec Wld—Aug. 25, 1906. No. 78865. Jour—Dec., 1905. No. 74074.

## Armature Windings.

Winding of Direct-Current Armatures. A. C. Jordan. An illustrated detailed description of the 101 B armature, with especial reference to the points of difference between this and the 38 B type. Type S armatures are also described, with general considerations of armature windings. 2000 w. Elec Jour—Jan, 1906. No. 74538.

## Auxiliaries.

The Betterment of Power-Station Economy by Electric Auxiliaries. Arthur S. Mann. Showing the importance of balancing the advantages of electrically operated auxiliaries against the value of the exhaust steam for heating purposes. 2500 w. Engineering Magazine—April, 1906. No. 75788 B.

## Australia.

The Traawool Scheme. An account of the irrigation and power proposal for providing an ample supply of water to northern and north-western Victoria, and for generating electricity for the supply of several towns. 2500 w. Aust Min Stand—Sept. 26, 1906. No. 80151 B.

## Baltimore.

Steam Turbine Station of Baltimore Electric Power Company. J. R. Bibbins. Illustrated description of the Gould St. Station and its equipment. 2200 w. Elec Wld—July 14, 1906. No. 77959.

The Westport Power Plant at Baltimore, Md. Illustrated description of an

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electric generating station with a capacity of 33000 h. p. The building is of reinforced concrete. 4000 w. Eng Rec—Sept. 1, 1906. No. 78925.

Westport Station of the Consolidated Gas, Electric Light and Power Company of Baltimore. Illustrated description of this power station and its equipment. The building is of reinforced concrete. 4500 w. Elec Wld—Sept. 1, 1906. No. 78976.

## Berlin.

Machinery for the Extension of the Berlin Electricity Works (Maschinenanlagen zur Erweiterung der Berliner Elektrizitätswerke). Illustrating two new generating sets of 6,500 h. p. each, the triple-expansion engines by Sulzer and by the Görlitz works, with A. E. G. alternators. 1800 w. 3 plates. Zeitschr d Ver Deutscher Ing—Dec. 9, 1905. No. 73807 D.

## Birmingham, Eng.

Birmingham Electric Supply. Illustrated detailed description of the Summerlane Station recently opened. 2500 w. Elec Engr, Lond—Oct. 12, 1906. Serial. 1st part. No. 80043 A.

## Bohemia.

Hohenfurth Plant in Bohemia. C. L. Durand. Illustrated description of the hydraulic station recently erected on the Moldau river. The current is distributed by a high-tension line operated on the three-phase system, and is used mainly in paper-making establishments. 2500 w. Elec Rev, N Y—March 31, 1906. No. 75846.

## Booster.

A Reversible Booster and Its Running. C. Turnbull. Read before the Newcastle Local Sec. of the Inst. of Elec. Engrs. An illustrated description of the Lancashire booster, its working and all matters relating to its application. 6000 w. Elec Engr, Lond—Jan. 19, 1906. No. 74736 A.

The Application of Automatic Boosters in Electric Stations (Anwendung von Selbsttätigen Zusatzmaschinen für Elektrizitätswerke). L. Schröder. Discussing especially the use of auxiliary dynamos in connection with the operation of street railway power stations. 3000 w. Elektrotechnik u Maschinenbau—April 8, 1906. No. 76256 D.

Notes on Booster Developments. A. H. Kelsall. Abstract of a paper read before the Glasgow Sec. of the Inst. of Elec. Engrs. Explains the action of the reversible booster, and the devices for making the booster changes automatic and its uses. 2400 w. Elect'n, Lond—April 20, 1906. No. 76440 A.

Notes on Booster Developments. A. H. Kelsall. Reviews a paper by this author read before the Glasgow Loc. Sec. of the Inst. of Elec. Engrs. Refers to old and new methods, and especially considers the Lancashire "automatic booster." 1500 w. Elec Engr, Lond—May 18, 1906. No. 76987 A.

## Breakdowns.

Breakdowns of Electrical Machinery. Michael Longridge. Abstracts from annual report, discussing some of the typical breakdowns, the causes that lead to them, and the lessons they convey. 3800 w. Mech Engr—Oct. 13, 1906. Serial. 1st part. No. 80041 A.

## Brighton.

The Brighton Corporation's New Electricity Works. Detailed illustrated description. 1600 w. Elect'n, Lond—June 15, 1906. Serial. 1st part. No. 77480 A.

## Brushes.

Brush Holders. Bernhard Zingelmann. Remarks on recent devices and improvements, and the requirements of a good brush-holder. 1800 w. Elec Rev, Lond—Jan. 12, 1906. No. 74513 A.

Investigations upon Dynamo Brushes (Ueber die Untersuchung von Dynamobürsten). E. Arnold. Data and results of experiments upon commutator of various materials and design, as regards efficiency and durability. 3000 w. Elektroleh v Maschinenbau—July 29, 1906. No. 78757 D.

Carbon Brushes v. Copper. E. Austin. Briefly considers the merits and demerits of the two kinds of brushes, urging the use of copper brushes for certain classes of machines. 900 w. Elec Engr, Lond—Aug. 30, 1906. No. 78126 A.

Tests on Dynamo Brushes. An account of tests, carried out under Prof. Arnold, consisting in the measurement of the voltage drop at different current densities between brushes of various qualities and a slip-ring rotated at various speeds. 2000 w. Elec Engr, Lond—Sept. 7, 1906. No. 79215 A.

## Central Stations.

A Modern Central Station Plant. Illustrated detailed description of the "No. 3" steam-operated station of the Edison Electric Company of Los Angeles, Cal. 1500 w. Power—Feb. 1906. No. 74896 C.

Central Station Power. E. F. Espenschied, Jr. On the use of power in the industries and so increasing the revenue producing hours, the motors required, etc. Discussion. 4000 w. Pro. Engrs' Soc of W Penn—March, 1906. No. 75621 D.

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## Charges

Hot Water, Heat, and Electric Light from a Central Station. Illustrated detailed description of the station at Marion, Ind., and the system of operation. 5000 w. Engr, U S A—June 1, 1906. No. 77080 C.

The Central Power Plant of the Oliver Estate, Pittsburg, Pa. A central plant, in the business part of a city, to furnish light, heat, and power to several large office buildings, and churches, a department store, club, and several smaller consumers. Ills. 1400 w. Eng Rec—June 23, 1906. No. 77432.

Modern Central Stations. Frank C. Perkins. This first of a series of illustrated articles describes the gas engine plants at Münster, in Westphalia, and Zeitz, Germany. 1500 w. Cent Sta—July, 1906. Serial. 1st part. No. 77859.

Central Station Light, Heat, and Power Principles. Newton Harrison. Considers the elements of direct current power and of alternating current power, types of current, apparent and real power, angle of lag, etc. Diagrams. 1600 w. Cent Sta—Aug., 1906. No. 78517.

Organization and Conduct of a New Business Department Suitable for Central Stations in Cities of 50,000 Population and Under. S. M. Kennedy. A \$300 prize paper giving suggestions for the commercial development of central stations. 4000 w. Elec Rev, N Y—Aug. 4, 1906. Serial. 1st part. No. 78389.

Organization and Conduct of a New Business Department, Suitable for Central Stations in Cities of 50,000 Population and Under. S. M. Kennedy. Second prize paper. Gives suggestions helpful in the commercial development of stations. 6600 w. Elec Wld—Aug. 4, 1906. No. 78457.

System of the Rockland Light and Power Company. An illustrated description of the system covering the Palisade district on the west bank of the Hudson River, near New York. 2800 w. Elec Wld—Aug. 4, 1906. No. 78450.

Central Station Light, Heat and Power Principles. Newton Harrison. Considers the effects of frequency, the synchronous and induction motor, effects of inductance, varying the power factor, the wattmeter, and various other subjects. 1500 w. Cent Sta—Oct., 1906. No. 79746.

## Charges.

Equitable Charging for the Supply of Energy by Municipal Electricity Undertakings. J. Horace Bowden. Shows that neither the maximum demand nor the flat rate systems are equitable, and sub-

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mits a system considered just and expedient. 1800 w. Elec Rev, Lond—Aug. 31, 1906. No. 79128 A.

## Chicago.

Power Plant of the Chicago Drainage Canal. An illustrated article dealing principally with the power-house and its equipment. 3900 w. Eng News—Jan. 18, 1906. No. 74457.

## Coal Handling.

See Mechanical Engineering, Power and Transmission.

## Combined Plant.

An Ice-Making Electric Light Station in Florida. James F. Hobart. Describes the plant of the Plant City Electric and Refrigerating Company and its operation. Ills. 1400 w. Elec Wld—Jan. 13, 1906. No. 74437.

The Economy of Combined Railway and Lighting Plants. Read at meeting of the N. W. Elec. Assn. Ernest Gonzenbach. Considers some of the commercial and economical features in the operation of combined railway and lighting plants. 3000 w. St Ry Rev—Feb. 15, 1906. No. 75231 C.

The Economy of Combined Railway and Lighting Plants. Ernest Gonzenbach. Abstract of a paper read before the N. W. Elec. Assn., at Chicago. Discusses the saving to be effected by combining railway and lighting service. 900 w. Elec Wld—Jan. 27, 1906. No. 74792.

Combined Lighting and Heating Station. Illustrates and describes an interesting combination heating and electric plant installed at Canton, Ohio. 1800 w. Elec Wld—Aug. 4, 1906. No. 78454.

A Combination Ice Making and Lighting Plant. Illustrated description of a new plant at Caruthersville, Mo., and discusses the advantages of combining electric lighting, ice-making and cold storage plants. 2500 w. Ice & Refrig—Sept., 1906. No. 78919 C.

## Commercial Problems.

Commercial and Engineering Tendencies Affecting Central Stations. J. H. Hallberg. A review of recent developments in power stations, distribution, lighting and other service. 3000 w. Elec Rev, N. Y.—Jan. 13, 1906. No. 74430.

## Commutators.

Computations for the Number of Elementary Groups and the Pressure between two Adjoining Commutator Segments (Berechnung der Zahl der Elementengruppen und der Spannung Zwischen Zwei Benachbarten Kollektoralarmen). N. Gennimatas. A mathe-



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## Commutation

mathematical discussion of the distribution of voltage between commutator segments. 2500 w. *Elektrotechnik u Maschinenbau*—March 25, 1906. No. 76254 D.

New Methods in the Care of Brush Arc Generator Commutators. C. M. Green. Directions with illustrations. 1000 w. *Elec Wld*—April 7, 1906. No. 76090.

Mechanical design of Commutators for Direct-Current Generators. R. Livingstone. The present number states the requirements of a satisfactory commutator, discussing each briefly, and explaining the causes of stress in different parts of a commutator. 1000 w. *Elect'n, Lond*—May 18, 1906. Serial. 1st part. No.

Construction of Commutators for Dynamos. A. G. Ellis. An illustrated article tracing the building of the commutator, beginning with the raw material and ending with the finished commutator. 1200 w. *Mech Engr*—July 21, 1906. Serial. 1st part. No. 78302 A.

## Commutation.

Mechanical Aids to Commutation. J. N. Dodd. Aims to define commutation and to explain the purpose and limits of the various devices meant to improve it. 6500 w. *Elec Jour*—June, 1906. No. 77313.

## Construction.

Construction of a Power Plant Under Difficulties. Edward C. Kinney. An account of a plant at Gothenburg, Nebr., and the method of overcoming difficulties with water in digging the pit. 2000 w. *Jour Assn of Engng Soc's*—March, 1906. No. 77318 C.

The Construction of Modern Electrical Machinery (*Moderne Anschauungen über die Konstruktion Elektrischer Maschinen*). E. Ziehl. A review of standard practice in the construction of dynamos and motors and of rotary converters, showing the extent to which designs have become systematized. 5000 w. *Elektrotech Zeitschr*—Oct. 11, 1906. No. 79962 B.

## Converters.

Shunt and Compound-Wound Synchronous Converters for Railway Work. W. L. Waters. Discusses and compares the advantages and disadvantages of the two methods of excitation. Considers the best system for general work is to have shunt-wound converters, standard transformers, and no reactance coils. 1600 w. *Pro Am Inst of Elec Engrs*—May, 1906. No. 76941 D.

Synchronous Converters Versus Motor Generators. Clarence P. Fowler. A comparison of their efficiency, floor space and cost, inherent regulation and voltage control, overload capacity, methods of start-

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ing, hunting, power factor, frequency, and reversibility. 3300 w. *Elec Wld*—May 26, 1906. No. 76977.

Three to Six Transformation and Connections to Rotary Converters. Guy J. Reynolds. Explains the three ways of transforming from three to six-phase current. 600 w. *Elec Wld*—May 19, 1906. No. 76742.

## Costs.

Cost of Generating Electric Power. F. A. Giffin. Gives formulæ and figures intended to be applicable to a modern, power-station containing four 1000-kw. units, and assumptions are made regarding the manner in which the efficiency of each piece of apparatus varies with the load. 2000 w. *St. Ry Jour*—Dec. 30, 1905. No. 74122 C.

Rates for Electric Current in Chicago. A report to the Gas, Oil and Electric Light Committee of the Chicago City Council by B. J. Arnold and William Carroll. 3800 w. *Eng Rec*—April 14, 1906. No. 76315.

The Cost of Electricity Per Unit from Private Electrical Plants. Review of a paper by Wilson Hartnell, before the Leeds Loc. Sec of the Inst. of Elec. Engrs., criticizing the accuracy of some statements made. 1200 w. *Elec Engr, Lond*—March 23, 1906. No. 75899 A. 76991 A.

## Developments.

Modern Electrical Developments. G. F. Metzger. Abstract of a paper before the Manchester Assn. of Engrs. Deals with electric supply as given from central stations or private plants for lighting, tramway, or motive power. 3500 w. *Mech Engr*—Feb. 3, 1906. No. 74986 A.

## Duluth.

The Plant of the Great Northern Power Company of Duluth, Minn. F. M. Feiker. This hydro-electric plant now under construction, will have an initial capacity of 30,000 h. p., with an ultimate capacity of 80,000 h. p. Power will be transmitted 14 miles to Duluth and Superior. Ills. 1800 w. *Elec Wld*—July 28, 1906. No. 78336.

## Dynamos.

Repairing Dynamo Electric Machinery. Norman G. Meade. Illustrates and describes useful devices and methods. 1200 w. *Power*—July, 1906. No. 77522 C.

High-Speed and High-Voltage Continuous-Current Dynamos. H. M. Hobart. Describes a study made by the writer for a 1000 kw. 1000 volt 1000 revs. per min. continuous-current dynamo. 1700 w. *Elect'n, Lond*—June 29, 1906. No. 77888 A.

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How to Build a Small Alternating-Current Dynamo Without Castings. Nevil Monroe Hopkins. Illustrates and describes a machine which produces a single-phase alternating current of 110-volts pressure, and is built without patterns or castings. 5000 w. Sci Am Sup—Nov. 11, 1905. No. 73095.

Auxiliary Reversing Poles for Large Continuous-Current Dynamos. H. M. Hobart. On the use of auxiliary reversing poles for direct-current, turbine driven generators. Shows how this pole can be applied to a 750-kw., 250-volt generator driven at 1500 revolutions, showing the considerations entering into the design. Ills. 3500 w. Elec Rev, N. Y.—Jan. 20, 1906. No. 74468.

A study in the Design of a 500-K. W. Continuous-Current Generator. Dr. Max Breslau. Determines a common basis for the comparison of the different formulae generally used as a criterion for the sparking conditions, and discusses the figures and dimensions of this special machine. Ills. 3300 w. Electn, Lond—March 9, 1906. Serial, 1st part No. 75593 A.

The Conversion of Energy in Dynamo-Machines (Ueber die Umwandlung der Energie in Dynamomaschinen). Karl Pichelmayer. A general study of the transformation of energy and the theories of leading physicists, with illustrations taken principally of electrical machinery 4000 w. Elektrotech u Maschinnebau—Feb. 25, 1906. No. 75746 D.

## Economies.

The Easiest Place to Work Central Station Economies. R. B. Holbrook. Considers the economies needed in the boiler-room. 2000 w. Elec Wld—Sept.

## Economy.

The Effect of Day Load on Central Station Economy. J. P. Jones. A symposium presented before the convention of the Iowa Electrical Association. 4000 w. Elec Rev, N. Y.—May 12, 1906. No. 76601.

## Efficiency.

The Efficiency of Electrical Power Generating Stations. H. M. Hobart. A study of the net annual efficiency of electric supply stations. Also editorial. 3000 w. Elec Wld & Engr—Nov. 25, 1905. No. 73466.

Power Plant Economics. Henry G. Stott. An analysis of the losses in the conversion of coal into electric current, and discussion of means for diminishing them, with account of the latest practice in prime movers and other electric station

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1, 1906. No. 78981. features. Diagrams and tables. 5000 w. Pro Am Inst of Elec Engrs—Jan, 1906. No. 74761 D.

Discussion on "Power Plant Economics," at Pittsburg, Pa., February 13, 1906. Discussion of Henry G. Stott's paper on this subject. 5400 w. Pro Am Inst of Elec Engrs—May, 1906. No. 76942 D.

Relative Economies of Electrical Supply from Small Local Stations and from Power Companies. John F. C. Snell. Read before the Incor. Munic. Elec. Assn. Deals with the cost of generation, showing that small districts will find it more economical to take supply from outside source when available. 3300 w. Elec. Engr, Lond—June 22, 1906. No. 77777 A.

## Electrical Connections.

Electrical Connections for Power Stations. David B. Rushmore. Discusses general principles, considering generators, transformers, lines, bus-bars, and switches with their relays. Ills. 3000 w. Pro Am Inst of Elec Engrs—July, 1906. No. 78357 D.

## Electric Machinery.

High-Speed Electric Machinery, with Special Reference to Steam-Turbine Machines. Prof. Silvanus P. Thompson. Howard lecture. Discusses the problems of electric design as affected by speed and rated output in this first lecture. Ills. 6200 w. Jour Soc of Arts—Sept. 14, 1906. Serial. 1st part. No. 79437 A.

## Extensions.

Recent Extensions at the Manchester Electricity Works. An illustrated account of some of the more important extensions recently made. The present article describes the 500 k.w. La Cour motor-converters, the principle and design. 2700 w. Elect'n, Lond—March 30, 1906. Serial. 1st part. No. 76007 A.

## Gas Power.

See Mechanical Engineering, Combustion Motors.

## Generating Set.

The New Steam-Dynamo Group at the Moabit Station in Berlin (Die Neuen Dampfodynamogruppen der Zentrale Moabit in Berlin). Illustrating especially the 6000 horse-power horizontal triple-expansion steam engines by Sulzer Bros. with direct-connected A. E. G. alternators. 1200 w. 2 plates. Schweiz Bauzeitung—May 5, 1906. No. 76832 B.

## Generators.

The Design of Electric Generators. W. O. Horsnail. On the use of comparative formulæ in the mechanical design of elec-

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tric generators. 2500 w. Engng—May 11, 1906. No. 76761 A.

Three-Wire Direct-Current Generators. A. H. McIntire. Based on a lecture by W. A. Dick. Illustrates and describes these machines and their working. 1000 w. Elec Jour—May, 1906. No. 76706.

Some Notes on the Mechanical Design of Electrical Generators. R. Livingstone. Notes relating mostly to direct-coupled generators. 1300 w. Elect'n, Lond—July 27, 1906. No. 78469 A.

## Governors.

Electromagnetic Control of Governors. Harry R. Speyer. Explains the action of the electro-magnetic control of the governor of the steam engine which drives the dynamos. Ills. 1100 w. Elec Engr, Lond—April 20, 1906. No. 76436 A.

## Hartford.

The Dutch Point Station of the Hartford Electric Light Company. Illustrated description of a new steam-turbine-driven station. 2000 w. Elec Wld—March 3, 1906. No. 75353.

## Houston, Tex.

The Houston, Tex., Lighting and Power Company. An illustrated article giving information of the recently improved plant of this company and its equipment and operation. 3000 w. Elec Wld—March 24, 1906. No. 75690.

## Hydro-Electric.

Hydroelectric Plant on the Spring River, Kansas. Illustrated description of an interesting plant supplying electric power to the lead and zinc fields of Missouri. 3500 w. Elec Rev, N Y—Nov. 18, 1905. No. 73257.

The Hydro-Electric Plant of the Spring River Power Co. Illustrated description of a plant for furnishing power to the zinc mines near Joplin, Mo. The plant shows novel features of interest. 4000 w. Engr, U S A—Nov. 1, 1905. No. 72951 C.

Les Clées-Yverdon Hydraulic Plant. C. L. Durant. An illustrated description of a system furnishing power for numerous applications of electric motors and in small industries, as well as for large shops and for lighting. 3500 w. Elec Rev, N Y—Nov. 25, 1905. No. 73470.

Niagara Power in the Gorge. An illustrated historical review of the development of power in the gorge, dating back to 1853. 3500 w. Elec Wld & Engr—Nov. 18, 1905. Serial. 1st part. No. 73244.

The Charmey Power Station (Usine de Charmey). A Hostache. An illustrated description of the hydro-electric plant at

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Charmey, supplying the district about Bulle, near Fribourg, Switzerland. 2000 w. Bull Tech de la Suisse Rom—Oct. 25, 1905. No. 73367 D.

The Hydraulic Plant of the Chattanooga & Tennessee River Power Co. Brief illustrated description of a plant for utilizing 56,000 h. p. of the energy of the Tennessee River, at Hales Bar, Tenn. 1200 w. Eng Rec—Nov. 4, 1905. No. 73062.

The Kaiserwerke Hydro-Electric Station in the Tyrolese Oberland (Die Ueberland Zentrale Kaiserwerke). H. Manasse. A very fully illustrated account of the utilization of the discharge of Hinterotener Lake in the Tyrol, near Kufstein. Serial. Part I. 3500 w. Elektrotech Zeitschr—Nov. 9, 1905. No. 73355 B.

The Niagara Power Plant of the Electrical Development Company of Ontario. Begins an illustrated detailed description of the design and structures. 3000 w. Eng News—Nov. 9, 1905. Serial. 1st part. No. 73079.

The Washoe Power and Development Company's Plant on the Truckee River. Wyatt H. Allen. Illustrated detailed description of a plant for supplying the towns of Reno and Sparks, Nevada, with electric power and the final union of four companies, forming the "Union Light & Water Co." 4500 w. Jour of Elec—Nov., 1905. No. 73067 C.

Construction of Canadian Niagara Power Company's 100,000-Horse-Power Hydroelectric Plant at Niagara Falls, Ontario. Cecil B. Smith. Abstract of a paper read before the Canadian Soc. of Civ Engrs. Describes the construction work, buildings, machinery, &c. 5000 w. Elec Rev, N Y—Dec. 2, 1905. No. 73512.

Hydraulic Station at Cusset, near Lyons, France. F. M. Bryan. An illustrated description of one of the largest hydraulic plants in France, which utilizes the power of the Rhone for operating lamps and motors in the city of Lyons. 3000 w. Elec Wld & Engr—Dec. 9, 1905. No. 73665.

Hydro-Electric Development at Garvins Falls, Bow, N. H. Edward B. Richardson. A detailed description of the station equipment. The plant will have a total capacity of 3,950 kw. 2800 w. Jour Assn of Engng Soc's—Oct., 1905. No. 73749 C.

The Garvins Falls Dam, Canal and Hydro-Electric Plant, Bow, N. H. George G. Shedd. An illustrated description of the power development at this point on the Merrimac River, about four miles below Concord, N. H. 3500 w. Jour Assn of Engng Soc's—Oct., 1905. No. 73748 C.

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Hydro-Electric Development in Italy. L. Ramakers. Illustrated detailed description of the 36,000 volt transmission plant at Montereale-Cellina. 2000 w. *Am Elect'n*—Dec., 1905. No. 73564.

Hydro-Electric Power Under the Highest Head in New England. Illustrated detailed description of the interesting plant of the Chittenden Power Co., near Rutland, Vt. 4000 w. *Elec Wld & Engr*—Dec. 2, 1905. No. 73612.

The Chatel St. Denis Station (Usine de Chatel-St.-Denis). K. A. Breuer. A fully illustrated description of one of the power houses of the Freybourg district in Switzerland. Serial. Part I. 2000 w. 1 plate. *Bull Tech de la Suisse Rom*—Nov. 25, 1905. No. 73879 D.

The Hydraulic Works of the Chittenden Power Co., Rutland. An illustrated description of a plant which will furnish electricity for street railway, light and power purposes at Rutland, Vt. 3000 w. *Eng Rec*—Dec. 9, 1905. No. 73673.

The Hydro-Electric Power Plant of the Brembo River. Dr. Alfred Gradenwitz. Illustrates and describes this recently completed plant in northern Italy. 1200 w. *Sci Am Sup*—Dec. 30, 1905. No. 74062.

The Hydro-Electric Station at Champ. A. Steens. Illustrated description of a power plant built to furnish electricity for motive power in various industrial establishments in the vicinity of the Fure and Morge valleys. Contains an important reinforced-concrete conduit. 2000 w. *Eng Rec*—Dec. 9, 1905. No. 73671.

The Trinity River Plant of the North Mountain Power Company. Brief illustrated description of an interesting power transmission system of the Pacific Coast, and some of the difficulties of its construction. 1200 w. *R R Gaz*—Vol. XXXIX., No. 26. No. 74085.

Additional Power Development at Sewalls Falls. N. H. Edw. B. Richardson. Illustrated detailed description of a new power station on the Merrimac River, in which vertical direct-connected units were installed. 5000 w. *Eng Rec*—Jan. 6, 1906. No. 74277.

A High Head Water Power Electric Plant on the Animas River, Colo. George M. Peek. Illustrates and describes a plant employing a static head of nearly 1000 ft. and generating electric current at 50,000 volts pressure for transmission to the important mining camps of Durango and Silverton, 25 miles distant. 1500 w. *Eng News*, Jan. 4, 1906. No. 74168.

Hydro-Electric Lighting and Power Plant at Harrisonburg, Virginia. F. F. Coleman. Illustrates and describes a

plant on the Shenandoah River which is an example of the possibilities in the development of numerous single waterfalls. 200 w. *Elec Wld & Engr*—Dec. 30, 1905. No. 74165.

Jhelum River Hydroelectric Power Installation in British India. Gives a description of the water-wheels and generator connections. 1600 w. *Elec Rev*, N. Y.—Jan. 6, 1906. No. 74234.

The Jhelum River Power Plant. Illustrated account of this installation in British India, describing the country and also the plant. 4500 w. *Jour of Elec*—Jan., 1906. No. 74307 C.

The Hydraulic Accumulator Station at Ruppoldingen, Switzerland. (Die Akkumulierungsanlage in Ruppoldingen, in der Schweiz). S. Herzog. Power is stored hydraulically to aid in overcoming the peak of the load on the dynamos. Two articles, 4000 w. *Zeitschr f Elektrotechnik*—Dec. 17, 24, 1905. No. 74657 each D.

The Hydro-Electric Power Station of the City of Preran, Moravia (Hydroelektrische Kraftzentrale der Stadt Preran). A. Martinek. Plans of the buildings and details of the turbines. 1500 w. *Elektrotech u Maschinenbau*—Jan. 1, 1906. No. 74659 D.

The Mazarin Hydro-Electric Station (Installation Hydro-Electrique de l'Usine Mazarin). Ch. Dantin. An illustrated description of the hydraulic plant at Mézieres in the North of France, utilizing the power of the Meuse and delivering it to the Clément automobile works. 2000 w. 1 plate. *Génie Civil*—Dec. 16, 1905. No. 74622 D.

The Montbovon Hydro-Electric Station (L'Usine de Montbovon). D. Gauchat. Describing the plant utilizing the power of the Sarine above the lake of Geneva, Switzerland. 1800 w. *Bull Tech de la Suisse Rom*—Jan. 10, 1906. No. 74668 D.

The Plant of the Vancouver Power Company (Ltd.). Wynn Meredith. Illustrated detailed description of this interesting plant on the Pacific Coast, the power of a glacial lake being utilized. 5800 w. *Jour of Elec*—Jan., 1906. Serial. 1st part. No. 74306 C.

Hydro-Electric Plant at Montereale. Illustrates and describes a plant which utilizes the energy of the Cellina River, and is intended to transport electricity for lighting and power purposes to Venice and surrounding districts. 2000 w. *Engr*, Lond.—Feb. 9, 1906. No. 75066 A.

The Hydro-Electric Station at Entraygues (L'Usine Hydro-Electrique d'Entraygues). P. Cafourier. Illustrated description of a station on the Argens, in

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the south of France, deriving about 3000 h. p. for delivery to Toulon and its environs. 3500 w. 1 plate. *Génie Civil*—Feb. 3, 1906. No. 75114 D.

The Kaiser Hydro-Electric Station (Die Kaiserwerke). S. Herzog. An illustrated description of the plant at Kufstein, in Tyrol, arranged to develop 3600 h. p. by tapping the Hintersteinsee. Serial. Part I. 3000 w. *Elektrotech u Maschinenbau*—Feb. 11, 1906. No. 75147 D.

Construction of the Neale Shoals Power Plant on Broad River, S. C. Francis J. Sellew. Description, with illustrations, of the engineering details and methods of construction employed on a recently completed plant. 8000 w. *Eng Rec*—March 3, 1906. No. 75397.

Hydro-Electric Enterprise in Canada. Paul N. Nunn. Illustrates and describes the development of the Ontario Power Company, at Niagara Falls. Presented at convention of the A. I. E. E. 4500 w. *Can Engr*—March, 1906. No. 75482.

Notes and Designs of Hydro-Electric Power Stations. (With Reference to the Influence of Load Factor.) David B. Rushmore. Discussion with diagrams of various features, with particular reference to the economic side of such plants and electric transmission of power. 4000 w. *Am Inst of Elec Engrs*—March 23, 1906. No. 75658 D.

Power Development at St. Croix Falls for the Minneapolis General Electric Company. Adolph Edsten. General plan and illustrations with description. 2300 w. *Eng Rec*—March 3, 1906. No. 75405.

The Feistritzhammer Electric Station at Krieglach. (*Elektrizitätswerk Feistritzhammer in Krieglach*.) G. Witz. An illustrated description of a plant deriving 350 h. p. from the river Mürz, at Krieglach in Styria. 3000 w. 1 plate. *Zeitschr d Oesterr Ing u Arch Ver*—Feb. 23, 1906. No. 75732 D.

The Relation of Load-Factor to the Evaluation of Hydroelectric Plants. S. B. Storer. Discussion and diagrams showing the effect of load factor upon steam and water driven electric plants respectively, and a conclusion that with constant flow of water, the earning power, and hence the value of the hydro-electric plant is proportional to the load factor. 1000 w. *Am Inst of Elec Engrs*—March 23, 1906. No. 75657 D.

Two Interesting Tyrol Hydroelectric Plants. Franz Koester. Brief illustrated descriptions of the plants at "Malser-

heide," near Glurns, and "Reinzwerke" of the City of Brixen. 2000 w. *Elec Rev, N. Y.*—March 24, 1906. No. 75665.

Utilization of the Waters of Lake Titicaca, Peru. Emile Guarini. Proposes a rather unusual plan for furnishing Peru with cheap power and afterwards utilizing the water for irrigation. 1300 w. *Elec Rec, N. Y.*—March 24, 1906. No. 75664.

Hydro-Electrical Installations of Upper Italy. From a paper read by G. Semenza, before the Society of Civil Engrs. of France. Explains why the installation of hydro-electrical machinery is of immense value to Italy, and gives information of a number of important instalments. 3000 w. *Elec Engr, Lond*—March 30, 1906. No. 76003 A.

Hydro-electric Development in the Adirondacks. Illustrates and describes the plant at Hannawa Falls, where the water of the Raquette River drives the electric generators, and turns the wheels that operate the grinders of a pulp mill. 3000 w. *Elec Wld*—April 21, 1906. No. 76183.

Hydro-Electric Power Plants of California. C. W. Whitney. Reviews briefly the electrical and hydraulic developments of some of the typical power plants of the State. Ills. 7500 w. *Cal Jour of Tech*—Feb., 1906. No. 75957 C.

The Electric Station at Wagnen on the Aar (*Das Elektrizitätswerk Wagnen a. d. Aare*). L. Zodel. A fully illustrated description of a plant developing 9000 h. p. from the hydraulic power of the Aar, being the largest hydro-electric station in Switzerland. Two pairs of horizontal turbines are direct-connected to each dynamo. Two articles, 3000 w. *Schweiz Bauzeitung*—April 7, 14, 1906. No. 76251 each B.

The Electric Station at Wagnen, on the Aar (*Das Elektrizitätswerk Wagnen on der Aare*). K. Meyer. An illustrated description of the new power plant at Wagnen, Switzerland, where 4,500 horse power is developed from the Aar, for distribution in the Cantons of Solothurn and Bern, and in German Alsace. Serial. Part I. 3000 w. *Zeitschr d Ver Deutscher Ing*—May 12, 1906. No. 76815 D.

The Hauterive Power Station (*Usine de Hauterive*). A. Weber. A fully illustrated description of the hydro-electric station on the Sarine, in the Canton of Fribourg, Switzerland, for the development of 10,000 horse power. 5 articles, 8000 w. *Bull Tech de la Suisse Romande*. Jan. 25, Feb. 10, 25. March 10, 25, 1906. No. 76263 each D.

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The Hydraulic Power Development of the Animas Power and Water Co. George M. Peek. Illustrated description of this plant in Colorado, built by a company incorporated for the purpose of building irrigation canals, reservoirs, and developing water power. 1600 w. Eng Rec—April 14, 1906. No. 76319.

The Hydro-electric Plant of the Animas Power and Water Company. Malcolm Lloyd. Illustrated description of a hydraulic power plant in the southwestern part of Colorado which promises to revolutionize the mining and commercial industries of the region. 3500 w. Elec Rev, N Y—April 21, 1906. No. 76158.

The Sill Electricity Works. Illustrated description of one of the most important hydro-electric plants recently installed in the Austrian Alps. It is designed for a capacity of 15,000 h. p. with high-pressure Pelton turbines, and will supply Innsbruck and its vicinity with electricity. 2300 w. Engr, Lond—March 23, 1906. No. 75909 A.

Hydro-electric Plant of the City of Drammen, Norway. Franz Koester. Illustrated, detailed description of an installation including a generating station, a step-up transformer system, a long-distance high-tension transmission line, step-down transformer sub-stations and low-tension distributing system. 2500 w. Elec Rev, N Y—May 12, 1906. No. 76600.

Hydraulic Features of the Plant of the Pike's Peak Hydro-Electric Co., Manitou, Colo. Plan and section of the station, with description and illustrations. 2500 w. Eng Rec—May 19, 1906. No. 76734.

Plant of the Pike's Peak Hydro-Electric Company. Illustrated detailed description of a plant at Manitou, Colorado, which employs the highest head of water yet attempted, the static head being 2417 ft., and other features of interest. 4000 w. Elec Wld—May 26, 1906. No. 76975.

The Hydro-Electric Developments at Trenton Falls, N. Y. Illustrated description of an interesting electrical development in Central New York. Also editorial. 2000 w. Elec Wld—May 19, 1906. No. 76740.

Hydro-Electric Plant at Albany, Ga. R. W. Hutchinson, Jr. Illustrates and describes a water power development in the south, at the Big Shoals on the Muckafoonee River. 2000 w. Elec Wld—June 16, 1906. No. 77347.

The American Falls Power, Light and Water Company, Limited, the Idaho Consolidated Power Company, and the American Falls Power Company. An illustrated description of the development

of these power installations in Idaho. 2500 w. Elec Rev, N. Y.—June 2, 1906. No. 77110.

Madison River Power Company's Plant. G. W. Craven. Describes this river valley in Montana, and describes the plant for utilizing the power. 1700 w. Jour Assn of Engng Soc's—March, 1906. No. 77317 C.

The Hydro-Electric Station on the Sill near Innsbruck (Die Sillwerke bei Innsbruck). J. Riehl and C. Arldt. A very fully illustrated description of the hydraulic and electric features of the plant for supplying the city of Innsbruck with light and power. An average of 13,000 h. p. is developed and transmitted over a distance of 8 kilometres. Three articles. 7500 w. Zeitschr d Ver Deutscher Ing—May 19, 26, June 9, 1906. No. 77600 each D.

The Works of the Mexican Light & Power Co., Ltd. An account of the development of the power of the Necaxa waterfall, 95 miles from the city of Mexico. Ills. 4000 w. Eng Rec—June 9, 1906. No. 77234.

Winnipeg, Manitoba, 60,000-Volt Hydro-Electric Plant. V. D. Moody. Illustrated detailed description of a modern water power plant, which utilizes the water of the Winnipeg River. 3500 w. Elec Wld—June 23, 1906. No. 77464.

A Hydro-Electric Generating Station at South Bend, Ind. Illustrated detailed description of a generating station on the left bank of the St. Joseph River and its equipment. 2000 w. Eng Rec—July 14, 1906. No. 77935.

A Model Turbine Power Station. Illustrated description of the new turbine plant built by the Baltimore Electric Power Company. 2500 w. Eng Rec—July 21, 1906. No. 78075.

Contracting for Use of Hydro-Electric Power on Railway Systems. G. A. Harvey. Read before the N. Y. State Convention. Discusses the effect of load factor on the cost of power, and methods of billing for power, and matters of related interest. 2500 w. St Ry Jour—June 30, 1906. No. 77729 C.

Hydro-Electric Plant on the Upper Adda (Impianto Idro-Elettrico sull' Alta Adda). An account of the plans proposed for the establishment of an electric station on the Adda for the transmission of power to Milan. 4000 w. Il Monitore Tecnico—June 30, 1906. No. 78180 D.

The Design of Hydro-Electric Installations as a Whole. E. F. Cassel. Abstract of a paper read before the Nat. Elec. Lgt. Assn. Discusses some of the

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problems met in designing hydraulic installations. 1800 w. Eng Rec—June 30, 1906. No. 77720.

The Hydro-Electric Power Plant of the Nevada Power Mining & Milling Co. J. D. Galloway. Illustrated detailed description of this plant in Inyo Co., California which transmits power to Goldfield and Tonopah, in Nevada. An excellent example of long span construction. 2500 w. Eng Rec—June 30, 1906. No. 77718.

The Power Plant of the Electrical Development Company, of Ontario. F. O. Blackwell. Read before the Can. Elec. Assn. Detailed description of the plant and the transmission line. 3000 w. Elec Rev, N Y—July 28, 1906. No. 78259.

Hydro-electric Power Station at Zogus. Illustrated description of one of the largest hydro-electric stations in Italy. 1000 w. Engr, Lond—Aug. 10, 1906. No. 78679 A.

The Hydro-electric Plant at Lucerne, Switzerland. Franz Koester. Illustrated description of a plant to supply light and power to the city, as well as to the Stanstad-Engelberg Railway. 2200 w. Elec Rev, N Y—Aug. 11, 1906. No. 78503.

The Hydro-Electric Plant of the City of Launceston, Tasmania (Wasserkraft-Elektrizitätswerk der Stadt Launceston). A. Martinek & A. Lauri. About 2500 h. p. are derived from the Esk and transmitted 3 miles to the city. Details of the turbines and electrical equipment are given. 3000 w. Elektrotech Zeitschr—July 19, 1906. No. 78747 B.

The Hydro-Electric Stations of Northern Italy (Die Hydroelektrischer Kraftzentralen Oberitaliens). A. Budau. A general review of the rapid development of hydraulic power in Northern Italy, with illustrations of the principal plants. 3000 w. Elektrotech u Maschinenbau—July 15, 1906. No. 78755 D.

The Hydro-Electric Stations of Vizzola and Turbigo, Lombardy (Usines Hydro-Electriques de Vizzola et de Turbigo, Lombardie). Illustrating and describing two important stations in Northern Italy, developing 25,000 horse power from the river Ticino. 3500 w. 1 plate. Génie Civil—July 21, 1906. No. 78718 D.

The Lucerne-Engelberg Electric Station (Elektrizitätswerk Luzern-Engelberg). C. Kilchmann. A very completely illustrated account of the new power plant by which 5000 h. p. is developed under 300 metres head, and transmitted about 25 miles to Lucerne.

Serial. Part 1. 2000 w. 1 plate. Schweiz Bauzeitung—July 14, 1906. No. 78727 B.

Electric Generating Station of the Holyoke Water Power Company. Illustrated detailed description of the largest water-power in New England, furnishing power for large paper mills and other industries. 3500 w. Elec Wld—Sept. 15, 1906. No. 79246.

The New Hydro-Electric Station of the Holyoke Water Co. The first of a series of articles giving an illustrated detailed description of this important plant, which furnishes power for large paper mills and other purposes. 2500 w. Eng Rec—Sept. 15, 1906. Serial. 1st part. No. 79156.

Electric Power from Southern Waterfalls. J. W. Fraser. Reviews the water power situation in the south since the introduction of the electric drive, and the progress of this work. Ills. 4500 w. Elec Rev, N Y—Sept. 8, 1906. No. 79051.

The Hydro-Electric Station at St. Cézaire on the Siagne (L'Usine Hydro-Electrique de la Siagne à Saint Cézaire). P. Chignaterie. Describing the tunnel and pipe line, with plans and details of the power station. The plant is to be operated with that at Entraygues, in the south of France, near Cannes. 2000 w. 1 plate. Génie Civil—Aug. 25, 1906. No. 79318 D.

The Truckee River General Electric Company. Extract from a forthcoming volume by A. W. Clapp. Illustrated description of the plant constructed to supply power to the Comstock mines, Nevada, and of additional plants. 2400 w. Elec Rev, N Y—Sept. 22, 1906. No. 79416.

Water-Power Station at Launceston, Tasmania. A. Martinek and A. Lauri. Abstract translation from *Elektrotechnische Zeitschrift*. Describes a turbine station, the water-power being derived from the South Esk River, and transmitted three miles. 1400 w. Elect'n, Lond—Aug. 24, 1906. No. 79004 A.

A Modern Swiss Hydro-Electric Power Station. Enrico Bignami. A handsomely illustrated description of the station at Obermatt, supplying power for the Stanstad-Engelberg electric railway. 3500 w. Engineering Magazine.—Nov., 1906. No. 79994 B.

Boffalora-Ticino Hydro-Electric Power Plant. Dr. Alfred Gradenwitz. Illustrated description of the plant supplying electrical energy to the cities of Milan, Pavia, Novara, and Vigevano. 900 w. Sci Am Sup—Oct. 27, 1906. No. 80095.

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## Installation

Developing Electricity from the Susquehanna. A. William Field. An illustrated account of the great dam being constructed at McCall Ferry, 60 miles from Philadelphia, intended to develop 75000 to 100000 h. p. 2000 w. Mfrs Rec—Oct. 4, 1906. No. 79596.

The Developments of Water Power in the Province of Ligure, Italy. Information concerning development work of interest from the ingenuity of the method of cheapening the hydraulic engineering connected with the schemes. 1600 w. Elec Rev, Lond—Sept. 21, 1906. No. 79576 A.

The Hydro-Electric Station of the Greenville-Carolina Power Co. William S. Ide. Illustrated description of a low-head water-power development supplying electric power for municipal, railway and industrial purposes. 4500 w. Eng Rec—Oct. 6, 1906. No. 79667.

The Necaxa Plant of the Mexican Light and Power Company. F. S. Pearson and F. O. Blackwell. Describes and illustrates a water-power developed and transmitted to the cities of Mexico and Puebla, and to the mining camps of Pachuca and El Oro. 3000 w. Pro Am Soc of Civ Engrs—Oct., 1906. No. 80101 E.

## Installation.

Practical Installation of Electrical Apparatus. Thomas W. Poppe. Gives a method applicable to any size of generator likely to be handled by the ordinary central station. Ills. 800 w. Elec Wld—May 5, 1906. No. 76551.

## Instruction.

Instruction of Men Operating Interconnected High and Low-Tension Systems, with Reference to Safety of Employees, Reliability of Service, and Resumption of Same After Partial or Total Interruption. W. F. Wells. Abstract of a paper at meeting of the Assn. of Edison Ill. Cos. 2800 w. Elec Rev, N Y—Nov. 18, 1905. No. 73256.

## Iron Losses.

See Electrical Engineering, Electro Physics.

## Isolated Plant.

Power and Lighting Equipment of a Modern Hotel. Illustrates and describes the engineering features of the Gotham hotel, at Fifth Ave. and Fifty-fifth St., New York City. 2000 w. Am Elect'n—Nov., 1905. No. 73054.

An Electric Power Plant in the West Indies. Percival Robert Moses. A general description of an isolated plant in a plantation, with tabulated records of per-

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formance, and details of operative costs. 3500 w. Engineering Magazine—Jan., 1906. No. 73896 B.

Power Plant of a Large Cotton Mill. W. H. Smead. Illustrates and describes an interesting electrical power plant at Charlotte, N. C., for operating cotton mills. 1300 w. Engr, U S A—Dec. 15, 1905. No. 73787 C.

The Mechanical Plant of the Tietz Warehouse in Munich (Die Technischen Einrichtungen des Warenhauses Hermann Tietz in München). Julius Weil. Describing the plant of a large department store. Four 200 h. p. Diesel motors are coupled direct to dynamos for power and lighting. 2000 w. Zeitschr d Ver Deutscher Ing—Nov. 25, 1905. No. 73803 D.

The Mechanical Plant in the Tietz Store in Munich. Notes and illustrations from an article by Julius Weil, in the *Zeitschrift* of the Soc. of German Engrs. Diesel engines are used. 1800 w. Eng Rec—Feb. 10, 1906. No. 74977.

Isolated Plants. H. L. Woolfenden. Gives facts concerning a typical office-building plant, and its features of interest. 2300 w. Elec Rev, N Y—Feb. 17, 1906. No. 75033.

Mechanical Plant of the New Wanamaker Store in New York. Illustrated detailed description of a plant to provide for the generation of electricity for lighting and power purposes, and also the heating, ventilating and general mechanical service of one of the largest department stores in the world. 4500 w. Eng Rec—Feb. 24, 1906. Serial. 1st part. No. 75261.

Electrical Equipment of Wanamaker's New York Store. Illustrated description of this installation for lighting, motors, heating, ventilating and mechanical service. 2700 w. Elec Wld—March 31, 1906. No. 75887.

The Power Plant for the New Wanamaker Store, Philadelphia. Illustrated description of a plant for a twelve-story department store, supplying electric power for lighting and motors, steam, compressed air, and water. It is located a block distant. 4500 w. Eng Rec—Oct. 28, 1905. No. 72905.

The Heating and Lighting Plant at Bryn Mawr College. George C. G. Gray. Illustrated detailed description of a central plant to serve a group of buildings. 3800 w. Eng Rec—Feb. 17, 1906. No. 75054.

The Design of an Isolated Power and Lighting Plant. Putnam A. Bates. From a paper read at meeting of the



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## Lackawanna Plant

Elec Engng Soc of Columbia Univ. Describes a plant installed to serve several machine shops. 2400 w. Eng Rec—March 10, 1906. No. 75480.

Installation and Maintenance of a Small Electric Light Plant. An illustrated description of the plant at Jordan, Minn., a town of 1200 inhabitants. 2500 w. Power—May, 1906. No. 76362 C.

The Central Station for the Armour Plants. Illustrated description of a plant for supplying power to a collection of factory buildings. 3500 w. Engr, U S A—April 2, 1906. No. 75889 C.

Isolated Plant Engineering. Putnam A. Bates. The need of considering each case, studying the results to be accomplished and the means. Discusses points to be kept in mind in determining the power plant equipment best suited to the conditions. 6500 w. Sch of Mines Qr—April, 1906. No. 78353 D.

## Lackawanna Plant.

The Power System of the Lackawanna R. R. in Luzerne Co., Pa. H. M. Warren. Deals with the preliminary estimates, plans and details of the plant under construction in the Nanticoke district, near Scranton, with its substations and transmission lines. 3800 w. Eng Rec—Nov. 4, 1905. No. 73059.

## Load Equalizers.

Electrochemical Processes as Central Station Load Equalizers. Extracts from paper by Elmer A. Sperry, pointing out how electrochemical processes may be applied to flatten out the central station load curve. 1000 w. Elec Wld—Aug. 4, 1906. No. 78453.

## Load Factor.

The Influence of Load Factor and Prime Mover Characteristics on Power Station Economy. J. R. Bibbins. A discussion based upon views set forth in the transactions of the Am. Inst. of Elec. Engrs., Feb., 1906. Considers only engine characteristics and load factor. 2200 w. Elec Jour—Oct., 1906. No. 79895.

The Load Factor of Electric Distribution Plants (Der Belastungsfaktor Elek-trischer Kraftverteilungs Anlagen). Nor-berg Schulz. A discussion of the performance of a number of generating stations in Sweden, with a number of load curves from the more important plants. 3500 w. Elektrotech Zeitschr—Sept. 13, 1906. No. 79949 B.

The Value and Design of Water Power Plants as Influenced by Load Factor. Dr. Frederic A. C. Perrine. A study of this

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problem as affecting hydro-electric plants. 3500 w. Jour Fr Inst—Oct., 1906. No. 79728 D.

## London.

A New Electric Power Scheme for London. Outlines the scheme of the Additional Electric Power Supply (London) Bill, discussing its main points. 3300 w. Engng—Nov. 24, 1905. No. 73603 A.

Bow Electric Generating Station. W. H. Patchell. Abstract of a paper read before the Inst. of Elec. Engrs. illustrating and describing the station and its equipment. 2500 w. Mech Engr—Dec. 16, 1905. Serial. 1st part. No. 74042 A.

The Greenwich Electricity Supply Station. Illustrated description of the London County Council's power-station. 3300 w. Engr, Lond—June 1, 1906. No. 77271 A.

## Management.

Central Station Economics in Massachusetts. A study of two typical medium-sized companies. The Salem Electric Lighting Co. and the Haverhill Electric Co. are considered. 2800 w. Elec Wld—Jan., 1906. No. 74314.

The Management of Small Central Stations. Henry Joseph. Discusses day loads and the necessity of keeping capital costs as low as possible on small systems. Meters and the prepayment system are also considered. 2800 w. Elec Rev, Lond—Dec. 29, 1905. No. 74290 A.

Power Plant Operation and Management. H. Schreiber. Discusses points of importance in securing economy and reliability. 2200 w. Jour of Elec—March, 1906. Serial, 1st part. No. 75469 C.

## Marion.

The Marion (Hackensack River) Station of the Public Service Corporation of New Jersey. Illustrated detailed description of this station and its equipment. 2000 w. Elec Wld—Jan., 1906. No. 74309.

## Motor Generators.

Some Features Affecting the Parallel Operation of Synchronous Motor Generator Sets. J. B. Taylor. Details of construction, connections, and method of operation to insure a desired diversion of load among such units, consisting of synchronous motors directly connected to alternating current generators. Diagrams and Ills. 4500 w. Am Inst of Elec Engrs—March 23, 1906. No. 75656 D.

## Municipal Plant.

A Municipal Steam Turbine Station at Columbus, Ohio. Illustrates and describes interesting details of the plant for

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street arc lighting. 2800 w. Eng Rec—March 31, 1906. No. 75882.

Oil-Engine Driven Electric Lighting Plant at Camden, N. J. H. B. Sweet. Illustrated description of a plant of interest on account of the motive power employed. 1200 w. Elec Wld—June 2, 1906. No. 77246.

The Frankfort Central Station. B. F. Hirschauer. Illustrated description of a large German municipal power plant. 2500 w. Elec Rev, N Y—Sept. 15, 1906. No. 79164.

## Newcastle.

The Newcastle Electric Supply Company. 2500 w. Elec Engr, Lond—May 11, 1906. No. 76754 A.

## New York.

The New Waterside Station of the New York Edison Company. Fully illustrated detailed description of this large station on the East river water-front, Manhattan, New York. 1300 w. Power—Dec., 1905. No. 73699 C.

## N. Y. Central.

The Steam-Electric Power Stations of the New York Central Railroad. Illustrated detailed description of the two power stations which are to supply electric current for the operation of suburban trains. 3500 w. Power—March, 1906. No. 75381 C.

## Operation.

Abnormal Operating Conditions of Electrical Apparatus. A. E. Buchenberg. Gives information and results prepared for central station men, showing the difficulties following any deviation from normal operating conditions. 2000 w. Elec Wld—Oct. 6, 1906. No. 79675.

## Parallel Operating.

Regulating Compound-wound Dynamos Operating in Parallel. Directions with diagrams. 1200 w. Power—April, 1906. No. 75856 C.

## Parallel Running.

Notes on the Parallel Running of Alternators (Vorrichtung zum Selbststättigen Parallelschalten von Drehstrommaschinen). Dr. G. Benischke. Describing automatic synchronizing devices for starting alternators in parallel. 3000 w. Elektrotech Zeitschr—July 5, 1906. No. 78168 B.

The Parallel Operation of Alternators (Ueber den Parallelbetrieb von Wechselstrommaschinen). Dr. L. Fleischmann. Deriving formulas for arranging the parallel operation of alternators of different electrical and mechanical design. 2500 w. Elektrotech Zeitschr—Sept. 20, 1906. No. 79950 B.

## GENERATING STATIONS

## Power Houses

## Paris.

The New St. Denis Electric Plant at Paris. C. L. Durand. Illustrated description of an interesting steam turbine plant under construction, and of its equipment. 6000 w. Elec Rev, N Y—July 28, 1906. No. 78258.

Alfortville Central Station and the System Controlled by the Est-Lumière Company (near Paris). C. L. Durand. Illustrated description of a large central plant erected on the banks of the Seine, producing three-phase current at 5000 volts, using the Alioth system of electrical apparatus. 3000 w. Elec Rev, N Y—Aug. 4, 1906. No. 78388.

## Polarity.

Correcting Reversed Polarity in Large Generators. H. R. Mason. Discusses the best methods to use with different types. 1700 w. Power—Nov., 1906. No. 80079 C.

## Power.

The Generation and Transmission of Power. Summarizes the practice in power station design, equipment and operation, storage batteries, voltages, sub-stations and portable sub-stations. Ills. 10000 w. St Ry Jour—Oct. 13, 1906. (Convention Sec.) No. 79818 C.

## Power Houses

The Long Island City Power Station of the Pennsylvania Railroad Company's Extensions to New York and Long Island. Illustrated detailed description of the plant and its equipment. 9200 w. St. Ry Rev—April 15, 1906. No. 76061 C.

The Long Island City Power Station. Illustrated detailed description of the design and equipment. 4200 w. Ir Age—April 5, 1906. Serial. 1st part. No. 75920.

The Pennsylvania Railroad's Extension to New York and Long Island. An illustrated article dealing principally with details of the Long Island City power station. 10000 w. Eng Rec—April 7, 1906. No. 75985.

The Pennsylvania Railroad's Extension to New York and Long Island—The Long Island City Power Station. Illustrated detailed description, dealing principally with the station and its equipment. 1200 w. St Ry Jour—April 7, 1906. No. 75990 C.

The Long Island Power Station of the Pennsylvania, New York and Long Island Railroad. Illustrated, detailed description of the station which is to furnish the very large amount of power needed by the Long Island Railroad, the new lines which are to tunnel under the East River, and the Atlantic Ave. improvement. 3000 w. Power—April, 1906. No. 75855 C.

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## Power Load

The Nassau (L. I.) Light and Power Company. An illustrated account of the development of a company covering the territory of a large portion of the central part of Long Island, involving distribution to a large number of small villages. 3800 w. Elec Wld—April 7, 1906. No. 76087.

The New Lighting and Power Station at Glenwood. Illustrated description of this new station of the Nassau Light & Power Co., which will supply electricity to the central part of Long Island. 6500 w. Eng Rec—April 14, 1906. No. 76314.

## Power Load.

Adjuncts to the Power Load. From a paper by C. J. Russell, read before the Assn. of Edison Illuminating Companies, discussing the possibilities of electric heating and of electro-chemical processes for increasing the central load, and leveling the load curve. 4500 w. Elec Wld—Oct. 6, 1906. No. 79676.

## Power Plants.

A Modern Power Plant. Illustrated description of a new plant located at Springfield, Ohio, for heating and lighting purposes. 1000 w. Power—Aug., 1906. No. 78324 C.

The Power Plants of the United Electric Light Company, Springfield, Mass. An illustrated article describing the general scheme of this system, and the interesting features of its three stations. 3500 w. Elec Wld—Aug. 25, 1906. No. 78862.

## Production.

Central Station Light, Heat and Power Principles. Newton Harrison. Discusses things of importance in the production of electricity on a large scale. 1700 w. Cent Sta—May, 1906. No. 76597.

## Relay.

The Overload and Reverse Current Relay. An illustrated description of an automatic device in which an increase in current starts a motor which operates a circuit breaker. 3000 w. Elec Rev, Lond—Dec. 29, 1905. Serial, 1st part. No. 74291 A.

## Records.

The Keeping of Consumers' Records in Electric Supply Undertakings. Describes a system found very successful. 1000 w. Elec Rev, Lond—March 23, 1906. No. 75900 A.

## Re-Winding.

Rewinding Dynamo Electrical Machinery. Norman G. Meade. Explains, with the aid of diagrams, a method of repair-

## GENERATING STATIONS

## Supervision

ing electrical machinery that can be adopted by manufacturing concerns having their own electric plants. Confined to direct-current machinery. 1600 w. Power—May, 1906. No. 76365 C.

## Rural Service.

District Supply in Rural Communities. Gives accounts of plants successfully operating a district supply service of electric light and power, with general remarks. 3500 w. Elec Wld—Jan., 1906. No. 74313.

## Scotland.

Electric Light and Power in the Highlands. W. B. Esson. An illustrated description of the plant furnishing light and power to the towns of Dingwall and Strathpeffer Spa. 2500 w. Elec Mag—April 24, 1906. No. 76482 A.

## Scranton, Pa.

Power Plant of the Lackawanna Light Company of Scranton, Pa. Illustrated detailed description of the station and its equipment, the underground system serving the business section and the overhead district. 2000 w. Elec Wld—Oct. 6, 1906. No. 79673.

## Short-Circuiting.

The Sudden Short-Circuiting of Polyphase Generators (Der Plotzliche Kurzschluss von Drehstromdynamos). F. Punga. A mathematical analysis of the difference in the effects of gradual and sudden short-circuits in alternators. 5000 w. Elektrotech Zeitschr—Sept. 6, 1906. No. 79358 B.

## Springfield, Ill.

The Springfield, Ill., Light, Heat and Power Co.'s Station and System. Illustrated detailed description. 3800 w. Elec Wld—Feb. 3, 1906. No. 74906.

## Station Design.

The Design of a Small Electric Power Station. James T. Hobart. The first of a series of articles dealing with the design, construction, selection and installation of machinery, operation of the plants, etc. 2500 w. Elec Wld—March 3, 1906. Serial, 1st part. No. 75356.

## Storage Battery.

Installing a Storage Battery and Booster. H. L. Strong. An account of some of the troubles encountered with this installation. Diagram. 900 w. Power—Aug., 1906. No. 78327 C.

## Supervision.

Official Supervision of Electric Plants (Die Beabsichtige Staatliche Ueberwachung Elektrischer Anlagen). H. Passavant. A discussion of the proposed government supervision of electric stations, showing that many other departments of

# ELECTRICAL ENGINEERING

## Supply

industry are far more dangerous. 6000 w. *Elektrotech Zeitschr*—Dec. 28, 1905. No. 74656 B.

The Proposed Official Supervision of Electric Plants (*Die Beabsichtige Staatliche Ueberwachung Elektrischer Anlagen*). H. Passavant. A discussion of the proposition to subject electrical installations in Germany to official regulations and supervision. 4500 w. *Zeitschr d Ver Deutscher Ing*—Jan. 20, 1906. No. 75103 D.

## Supply.

Central Stations versus Isolated Plant. Albert Yost. Discusses the economy of the service, and the conditions under which a private plant will pay. 2000 w. *Power*. Feb., 1906. No. 74902 C.

Industrial Power Supply from Municipal Stations. F. H. Carson. Briefly considers the financial soundness of some of the scales of charges, and the arguments urged in favor of such supply. 1600 w. *Elec Rev, Lond*—July 27, 1906. No. 78465 A.

Some Practical Notes on the Commercial Development of Electricity Supply Undertakings. R. Borlase Matthews. Discusses the need in England of a business-getting campaign in the electrical field. 1800 w. *Elec Rev, Lond*—Oct. 19, 1906. No. 80131 A.

## Switchboards.

Development in Design and Construction of Switchboards and Cable Runs for Large Direct Current Installations. Edward Schildhauer. An illustrated paper showing the development in switchboard design and construction of cable runs. 4500 w. *Wis Engr*—Feb., 1906. No. 75310 D.

Notes on Heavy Electric Switchgear. J. Whitcher. Abstract of a paper read before the Rugby Engng. Soc. A plea for simplicity in design, construction and operation, discussing details. 6000 w. *Mech Engr*—March 3, 1906. No. 75497 A.

Notes on Heavy Electric Switch Gear. J. Whitcher. Abstract of a paper read before the Rugby Engng. Society. Considers types of switches and circuit breakers. Short discussion. 2500 w. *Elect'n, Lond*—Jan. 5, 1906. No. 74407 A.

Switchboard Arrangement for Central Power Plants (*Vereinigte Schaltung und Bedienung von Betriebsmaschinen in Elektrischen Zentralen*). Karl Wertenson. Describing the arrangement at the municipal plant at Riga, in which the control of all the machinery is centralized at one switchboard. 2000 w. *Zeitschr d*

## GENERATING STATIONS

## Transformers

*Ver Deutscher Ing*—April 14, 1906. No. 76209 D.

The Ferranti-Field Three-Phase Switch. Illustrated description of one of the most recent designs of a large three-phase oil switch and its working. 1500 w. *Engng*—Jan. 5, 1906. No. 74418 A.

## Switzerland.

Electric Plant of the City of Thun, Switzerland. B. F. Hirschauer. Illustrates and describes this plant which is operated by hydraulic power, obtained from the river Aar. 2500 w. *Elec Rev, N Y*—Dec. 23, 1905. No. 73992.

Swiss Electrolytic Plants. C. L. Durand. Brief illustrated description of features of the plants at La Praz and at Cheddes. 1500 w. *Elec Rev, N Y*—Jan. 6, 1906. No. 74233.

The Installations of the Vaudoise Motor Power Company at the Lakes of Joux and Orbe, Switzerland. Franz Koester. Illustrates and describes interesting details of the installation. 3000 w. *Elec Rev, N Y*—Feb. 10, 1906. No. 74962.

See also Civil Engineering, Construction.

## Testing.

A. Scheme for Testing the Efficiency of Electrical Power Plants and for Keeping the Necessary Records. Wilmot E. Ellis. Outlines the scheme of tests and records that has been in operation in the Artillery District of Portland since Dec. 5, 1905, giving blanks used. 2800 w. *Jour U S Art*—March, 1906. No. 76792 D.

See Electrical Engineering, Measurement.

## Three-Phase.

Three-Phase Generating Set (*Groupe Electrogène Triphasé*). J. A. Montpellier. Illustrated description of a 600 horse power Rateau steam turbine connected to 400 kw. alternator by Sautter, Harlé & Co., exhibited at Liège. 2000 w. *L'Electricien*—Oct. 28, 1905. No. 73363 B.

## Transformers.

Properties of the Series Transformer. W. B. Gump. Gives an explanation of characteristics of the series transformer. Diagrams. 1700 w. *Elec Wld*—Sept. 1, 1906. No. 78979.

The Current Transformer. Kenneth L. Curtis. A study of transformers used in connection with electric meters, in order to convert the line currents into currents which are within the safe working limits of the meter. Diagrams, formulæ, and curves. 1700 w. *Am Inst of Elec Engrs*—Sept. 28, 1906. No. 79509 D.

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## Turbine Plant

Current Transformers for Instruments. States the requirements of current transformers, and investigates the determining features of the design. 1300 w. Elec Rev, Lond—Oct. 12, 1906. No. 80045 A.

The Treating of Transformer Oil. S. M. Kintner. Remarks on the detrimental effect of the presence of water to the insulating qualities of oil, and discussion of the ways of effecting a separation of oil and water. 2000 w. Elec Jour—Oct., 1906. No. 79897.

Transformer Design. A. Coggeshall. Aims to show how the size and weight of a transformer vary with the capacity and the density, and how the density at which the minimum losses obtain is readily found and the performance of the transformer predetermined. 600 w. Elec Wld—Oct. 13, 1906. No. 79773.

## Turbine Plant.

Turbine Plant of the Oshkosh Gas

## LIGHTING

## Balancers

Light Co. Illustrated description of a plant for supplying light and power to a city of 30,000 inhabitants. 1600 w. Engr, U S A—May 1, 1906. No. 76465 C.

## Turbo-Alternators.

Design of Turbo-Alternators. H. S. Meyer. Gives complete technical data of the 2,000 kw. turbo-alternators recently built for Yorkshire and Lancashire Power Co. Ills. 3800 w. Elect'n, Lond—Jan. 12, 1906. No. 74516 A.

## Ventilation.

The Ventilation of Turbo-dynamos (Ventilation von Turbo-dynamos). F. Niethammer. Discussing the arrangement of axial air inlets and radial discharge passages in the armatures of high-speed dynamos for direct connection to steam turbines. 3500 w. Elektrotech u Maschinenbau—April 22, 1906. No. 76847 D.

## LIGHTING

### Arcs.

Municipal Arc Lighting from Steam Turbine Power. Illustrates and describes the city plant at Columbus, Ohio. 2000 w. Elec Rev, N. Y.—March 10, 1906. No. 75447.

Arc Lamp Carbon Ends. Explains a way in which these parts may be joined and used the same as long carbons; also their value in lightning conductor work. 1400 w. Elec Rev, Lond—Aug. 17, 1906. No. 78844 A.

Flaming Arc Lamps. A review of paper by L. B. Marks, and H. E. Clifford, presented at the convention of the National Electric Light Assn., dealing with the constructional features and operating characteristics of these lamps. 1800 w. Elec Wld—Aug. 11, 1906. No. 78527.

### Arc Lamps.

Flame Arc Lamps. Leonard J. Pumphrey. An illustrated article presenting the advantages of these lamps, claiming great efficiency, and describing their construction. 2800 w. Elec Engr, Lond—Feb. 2, 1906. No. 74990 A.

A New Form of Electric Arc Lamp (Ueber eine Neue Form einer Elektrische Bogenlampe). E. Stadelmann. A mass of fire-clay or other incandescent material is placed adjacent to the arc, and when heated, becomes a partial conductor of incandescent effect. 1500 w. Elektrotech Zeitschr—May 3, 1906. No. 76855 B.

Arc Lighting. R. H. Henderson. Considers details of arc lamps, their opera-

tion and maintenance, classification, etc. 3000 w. Elec Jour—May, 1906. No. 76703.

Long Flame Arc Lamps. Leonard Andrews. Read before the Inst. of Elec. Engrs. Considers improvements effected, showing that increased efficiency is directly or indirectly due to increased length of arc. 2200 w. Elect'n, Lond—April 27, 1906. Serial. 1st part. No. 76564 A.

Improvement in Arc-Lamps. Editorial discussion of several recent improvements introduced in arc-lamps. 2000 w. Engng—May 25, 1906. No. 77144 A.

Influence of the Curve of Electromotive Force upon Arc Lamps (Einfluss der Kurve der Elektromotorischen Kraft auf Bogenlampen). C. Zorawski. Showing the influence of an irregular wave form in causing the production of noise in arc lamps. 1000 w. Elektrotech Zeitschr—June 28, 1906. No. 78164 B.

The Series Luminous Arc Rectifier System. N. R. Birge. Read before the Ohio Elec. Lgt. Assn. Illustrates and describes the construction and operation of this system. 1600 w. Engr, U S A—Oct. 1, 1906. No. 79599 C.

### Assembly Rooms.

Lighting of Public Halls and Lodge Rooms. J. R. Cravath and V. R. Lansing. Illustrates different arrangements, giving a critical discussion of the methods used. 800 w. Elec Wld—June 2, 1906. No. 77248.

### Balancers.

Regulation and Compounding of Light-

# ELECTRICAL ENGINEERING

## Bridge Lighting

ing Balancers. Budd Frankenfield. Gives methods for determining the regulation or the compounding. 2800 w. Elec Wld & Engr—Dec. 23, 1905. No. 74026.

## Bridge Lighting.

Electric Lighting of the Passy Bridge at Paris (Eclairage Electrique du Pont de Passy à Paris). E. Bret. Discussing especially the automatic apparatus for lighting and extinguishing the incandescent lamps by which the bridge is lighted. 1200 w. Génie Civil—May 5, 1906. No. 77611 D.

## California.

The Edison System of Southern California. R. H. Ballard. Read before the Nat. Elec. Lgt. Assn. An account of this extensive system and its remarkable development. 2800 w. Elec Rev, N Y—June 23, 1906. No. 77443.

## Carbons.

The Wilton Carbon Factory. An explanation of why this industry in England is threatened, and an illustrated description of the manufacture of arc lamp carbons as seen at Wilton. 2200 W. Elec Engr, Lond—March 16, 1906. No. 75668 A.

## Car Lighting.

Some Wiring Diagrams for Car Lighting. Cole Gough. Diagrams and descriptions of various wiring schemes. 500 w. St Ry Jour—Nov. 2, 1905. No. 73027 C.

## Charges.

The Price of Electricity. Robert Sever Hale. A discussion of the proper basis or unit of charge for an electric light company. 7000 w. Tech Qr—Sept., 1906. No. 80001 E.

## Churches.

The Lighting of Churches and Libraries. E. Leavenworth Elliott. Discusses the illumination of both gothic and churches of the amphitheater type and of libraries, giving suggestions. Ills. 2500 w. Cent Sta—Dec., 1905. No. 73655.

The Lighting of Churches. J. R. Cravath and V. R. Lansingh. Gives illustrations showing the lighting of various churches, with critical discussions of the methods used. 2000 w. Elec Wld—Oct. 6, 1906. No. 79674.

## Church Lighting.

Notes on the Lighting of Churches. Edwin R. Weeks. Discusses the requisites in church lighting, the systems of electric lighting for interiors, illustrating by an application. Ills. 1700 w. Pro Am Inst of Elec Engrs—May, 1906. No. 76940 D.

## LIGHTING

### Consumption.

The Watt Consumption and Lighting Power of Edison Incandescent Lamps (Ueber Wattverbrauch und Lichtstärke der Edison Glühlampe). R. Lucas. A proof of the law that the illuminating power is proportional to the cube of the consumption of energy. 1000 w. Elektrotech Zeitschr—May 31, 1906. No. 77651 B.

### Desk Lighting.

The Lighting of Desks. J. R. Cravath and V. R. Lansingh. States the requirements and considers a number of illustrations showing prevailing methods. 1000 w. Elec Wld—May 5, 1906. No. 76550.

### Factories.

Factory Lighting. E. Leavenworth Elliott. Suggestions for the successful illumination of various factories by electricity. 2500 w. Cent Sta—Jan., 1906. No. 74279.

### Frequency.

Electric Lighting with Various Frequencies (L'Eclairage Electrique aux Diverses Frequences). P. Lauriol. A study of the effects of alternating currents of various frequencies upon the flickering of incandescent lamps; showing that the choice of frequency should depend upon the nature of the service. 6000 w. Bull Soc Int des Electriciens—Feb., 1906. No. 75758 G.

Lighting on 25 Cycles in Buffalo. H. B. Alverson. On the success with 25-cycle lighting with incandescent lamps, and some causes that affect the illumination. 1500 w. Elec Jour—April, 1906. No. 76356.

The Variation of Candle-power Due to Frequency. P. O. Keilholtz and B. Harrison Branch. Reports experiments performed to determine the variation in the intensity of illumination of any incandescent lamp on a 25-cycle alternating-current circuit. Also editorial. 3000 w. Elec Jour—April, 1906. No. 76355.

### Globes.

The Effect of Acid Frosting and Enclosing Globes Upon the Life of Incandescent Electric Lamps. J. R. Cravath and V. R. Lansingh. A report of interesting tests, with a study of the results. 1500 w. Elec Wld—March 17, 1906. No. 75590.

### Glow-Lamps.

Notes on Glow-Lamp Standards and Glow-Lamp Photometry. J. S. Dow. On methods of testing and comparing. 2500 w. Elect'n, Lond—Sept. 14, 1906. No. 79455 A.

### Hotel Illumination.

The Illumination of the Hotel Astor,

# ELECTRICAL ENGINEERING

## Illumination

New York City. E. Leavenworth Elliott. An illustrated article describing some of the changes made which has made this one of the most successfully lighted of modern buildings of this class. 2500 w. Cent. Sta—Nov., 1905. No. 73110.

## Illumination.

Improvements in the Technology of Illumination (Neues aus der Beleuchtungstechnik). Arthur Libesny. A general discussion before the Vienna Electro-technical Society, referring to metallic-filament incandescent lamps, also improvements in arc and mercury-vapor lamps. Two articles, 5000 w. Elektrotech u Maschinenbau—May 20, 27, 1906. No. 77655 each D.

Some Physiological Factors in Illumination and Photometry. Louis Bell. Abstract of a paper read before the Ill. Engng. Soc. Points out some of the bearings of physiological optics upon practical illumination, its measurement and the limitations of its efficiency. 3000 w. Elec Rev, N Y—June 16, 1906. No. 77308.

Some Points in Illumination. Cole Tay. Discusses the fundamental characteristics of the problem and how to adapt them to the conditions in question. 2300 w. Elec Wld—June 2, 1906. No. 77247.

Illumination of a Residence. Ernest C. White. Describes the illumination of a residence by electric light, giving details of the equipment, and reasons for adopting it. 2700 w. Can Archt—July, 1906. No. 78323 C.

The Lighting of Halls and Corridors of Large Buildings. J. R. Cravath and V. R. Lansingh. An illustrated discussion of problems in connection with this work. 1200 w. Elec Wld—Aug. 4, 1906. No. 78451.

Illumination. Prof. W. S. Franklin and Prof. William Esty. A condensed chapter from a book by the authors. Deals with problem of efficient lighting of rooms. 2400 w. Elec Wld—Sept 1, 1906. No. 78978.

The Distribution of Illumination in the Neighborhood of a Row of Lamps. J. R. Benton. States formulas from which information concerning the illumination to be expected from such an arrangement, can be obtained, and matters of related interest. 2000 w. Elec Wld—Oct. 27, 1906. No. 80115.

## Incandescent.

The New Metallic Filament Lamp of Dr. Hans Kuzel (Einiges über die Neuen Metallfaden Lampen nach Verfahren Dr. Hans Kuzel). John. Kremenezky. Data and results of tests upon a new filament

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of which the composition is not given. The current consumption is about 1 watt per Hefner candle, with a life of 1,500 hours. 1500 w. Elektrotech u Maschinenbau—Feb. 4, 1906. No. 75146 D.

A New Method of Assorting Incandescent Lamps According to Age. Dr. Clayton H. Sharp. Explains a method sufficiently exact for the separation of good lamps from those that have depreciated, which requires no special apparatus or skill. 1800 w. Elec Wld—July 7, 1906. No. 77868.

Improved Incandescent Lamps (Neuere Elektrische Glühlampen). Dr. Feichmüller. Comparative costs of lighting with carbon filaments, and with tantalum, osmium, and other metallic filaments. 1500 w. Elektrotech Zeitschr—Sept. 20, 1906. No. 79954 B.

Modern Forms of Electric Incandescent Lamps. Dr. C. R. Böhm. Abstract translation from *Elektrotechnischer Anzeiger*. A summary of recent developments and the various filaments used, with an appendix by Prof. Alfred Lottermoser on colloids. 7000 w. Elect'n, Lond—Sept. 21, 1906. No. 79579 A.

Modern Glow Lamps with Metallic Filaments. Gives information concerning some of the new lamps which use metallic filaments of exceedingly high melting points. 1600 w. Elec Rev, Lond—Oct. 5, 1906. No. 79796 A.

## India.

The Electric Lighting of Lashkar City, Gwalior, Central India. Illustrates and describes the system adopted, which is a three-wire continuous current with 450 volts across the outers. 1000 w. Elec Rev, Lond—April, 27, 1906. No. 76561 A.

## Interiors.

The Lighting of Living Rooms and Parlors. J. R. Cravath and V. R. Lansingh. An illustrated article considering examples of good and bad lighting, and discussing the essentials of satisfactory arrangements. 3500 w. Elec Wld—Jan., 1906. No. 74311.

The Lighting of Dining and Bed Rooms. J. R. Cravath and V. R. Lansingh. Discusses good and bad arrangements for the lighting of these rooms by electricity. Ills. 3800 w. Elec Wld—Feb. 3, 1906. No. 74905.

The Lighting of Miscellaneous Rooms in Residences. J. R. Cravath and V. R. Lansingh. An illustrated article intended to supplement two previous articles on residence lighting. Considers large parlors, kitchens, the porch, bath room, basement and hall. 2000 w. Elec. Wld.—March 3, 1906. No. 75354.

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# ELECTRICAL ENGINEERING

## Intensity

### Intensity.

The Distribution of Illumination in the Neighborhood of Two Lamps. J. R. Benton. Explains how to ascertain the maximum intensity of illumination at any point, and how to find the proper candle-power to produce a given intensity of illumination. 2000 w. Elec Wld—May 5, 1906. No. 76549.

### Lamps.

The Economical Life of Incandescent Lamps. Lancelot W. Wild. Aims to show the relation existing between the economical life of ordinary commercial carbon filament incandescent lamps and the price per unit for electrical energy. 600 w. Elec Rev, Lond—April 6, 1906. No. 76072 A.

A Report on the Moore Tube Lamp. A report of measurements made of the illumination of the Nernst, incandescent and Moore lamps. 900 w. Elec Rev, N Y—Aug. 18, 1906. No. 78611.

Glow Lamps and the Grading of Voltages. William Henry Preece. Read before the British Assn. Considers glow lamps and their efficiency; the Nernst lamp; osmium, tantalum, zirconium, as filaments; mercury vapor lamps, the life of lamps, etc. Also voltage variation and regulation. 6500 w. Elec Engr, Lond—Aug. 10, 1906. No. 78666 A.

### Lamp Suspension.

Self-Sustaining Winch and Arc Lamp Suspension Gear. Illustrates and describes an interesting winch for lowering or raising arc lamps. 1000 w. Elec Engr, Lond—Oct. 12, 1906. No. 80044 A.

### Lamp Testing.

See Electrical Engineering, Measurement.

### Large Rooms.

The Lighting of Large Public Rooms. J. R. Cravath and V. R. Lansingh. An illustrated article considering the lighting of hotel lobbies, large railroad depots, halls, etc., 2000 w. Elec Wld—July 7, 1906. No. 77867.

### Law.

Builders, Building Owners and the Law of Electric Lighting. Explains some of the important principles of British law relating to electric lighting. 1800 w. Elec Rev, Lond—Aug. 17, 1906. Serial. 1st part. No. 78845 A.

### Mercury Arc.

Observations on the Mercury Arc and Some Resultant Problems in Photometry. C. Orme Bastian. Read before the Glasgow Sec. of the Inst. of Elec. Engrs. Shows that the mercury arc lamps will prove useful in combating other illumina-

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ants, and gives an interesting study of its luminosity. 3500 w. Elect'n, Lond—May 11, 1906. No. 76758 A.

The Mercury Arc: Its Properties and Technical Applications. E. Weintraub. Considers the structure of the mercury arc, the properties of the cathode, the starting, stability, etc., arcs in other metallic vapors, alternating-current phenomena, arcing and technical applications. 9500 w. Jour Fr Inst—Oct., 1906. No. 79727 D.

### Mercury Vapor.

The Production of Red Light in the Mercury Vapor Lamp. (Ueber die Erzeugung Roten Lichtes in der Quecksilberlampe). E. Gehrcke and O. von Baeyer. The color of the light is improved by adding zinc to the mercury; also a small amount of sodium to correct the yellow rays. 600 w. Elektrotech Zeitschr—April 19, 1906. No. 76852 B.

Some Fundamental Characteristics of Mercury Vapor Apparatus. Percy H. Thomas. Discusses some of the fundamental characteristics of mercury vapor apparatus, and their reactions on the related electric circuits, suggesting an explanation consistent with the latest theory of electricity. 9000 w. Pro Am Inst of Elec Engrs—July, 1906. No. 78359 D.

### Nernst.

Rare Earths and Electric Illuminants. Murray Beebe. Discusses the properties of some of the rare earth oxides, various experimental tests, and experiments with the Nernst glower. 6000 w. Wis Engr—June, 1906. No. 76699 D.

Concerning the Temperature of the Nernst Lamp. Leon W. Hartman. Gives details of temperature measurements made by the writer, following an entirely different method from the earlier investigations. 1500 w. Elect'n, Lond—July 27, 1906. No. 78470 A.

### Osram.

The Osram Lamp (Die Osram-Lampe). Data and results of tests by the Reichsanstalt upon the new incandescent electric lamp of Dr. Auer von Welsbach. 2000 w. Elektrotech Zeitschr—Aug. 9, 1906. No. 79348 B.

### Photometer.

See Electrical Engng. Measurement.

### Photometry.

See Electrical Engineering, Measurement.

### Progress.

The Progress in Electric Lighting. Leon Gaster. Describes the present manufacture of carbon filament lamps,



# ELECTRICAL ENGINEERING

## Rates

discussing the quality, candle power, etc., the proper selection of lamps, shades, improved filaments and other marks of progress. Discussion. 11800 w. Jour Soc of Arts—Feb. 9, 1906. No. 75064 A.

## Rates.

Equitable Rates in Relation to Rate Regulation. George M'Lean. Read before the Iowa Elec. Assn. An explanation of the lighting corporations' position, and a discussion of rate regulation. 2500 w. Elec Rev, N Y—May 12, 1906. No. 76602.

## Reflector.

The Diffusing Reflector. E. L. Zalinski. Information, based on measurements, made chiefly at the Electrical Testing Laboratories, in regard to the use of a different coating in connection with a prisms reflector, showing that the more important gain is the better distribution obtained. 2500 w. Elec Rev, N Y—Nov. 4, 1905. No. 73023.

The Effect of Diffusing Reflecting Coatings on Glass Prismatic Reflectors. Major E. L. Zalinski. Remarks on recent tests of the distribution and concentration of light by different reflectors. 700 w. Elec Wld—July 28, 1906. No. 78337.

## Residence Lighting.

An Example of House Lighting Design. J. R. Cravath and V. R. Lansingh. Gives plan and designs for a house recently built in Pasadena, Cal., where excellent illumination with a minimum operating cost was desired. 1800 w. Elec Wld—April 7, 1906. No. 76089.

Residence Lighting and Other Central Station Work at Wabash, Ind. An illustrated article describing the plant in a town of 9,000 inhabitants, where residence lighting forms a large proportion of the business. 2000 w. Elec Wld—May 12, 1906. No. 76652.

## Resorts.

Electric Lighting at Summer Resorts on the Atlantic Coast. An illustrated article describing illuminating effects at Coney Island, Atlantic City, Long Branch, and Asbury Park. 7400 w. Elec Wld—June 2, 1906. No. 77245.

## Shops.

Store Lighting. E. Leavenworth Elliott. Points in showing different wares to advantage, and the means of securing efficiency in store lighting and the lighting of show windows. 1500 w. Cent Sta—Feb. 1906. No. 74957.

## Street Lighting.

High Efficiency Incandescent Lamps for Street Lighting. Francis W. Wilcox,

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## Theatre Illumination

Read before the Ill. Engng. Soc., N. Y. Concerning recent improvements in the new high efficiency series lamps, and their advantages for street lighting. 3500 w. Elec Rev, N Y—June 2, 1906. No. 77112.

Street Lighting. C. Turnbull. Briefly considers Nernst lamps and lanterns, suggesting improvements in design. 800 w. Elec Rev, Lond—June 8, 1906. No. 77380 A.

Suggestions for Standard Methods of Arranging and Comparing Street Lighting Methods (Vorschläge zur Einheitlichen Beurteilung und Verfahren zur Berechnung der Strassenbeleuchtung). L. Bloch. A discussion of the best method of arranging street lamps, suggesting a standardizing of practice. 4000 w. Elektrotech Zeitschr—May 24, 1906. No. 77646 B.

## Streets.

Street Lighting. Haydn T. Harrison. Abstract of a paper read before the Manchester Sec. of the Inst. of Elec. Engrs. Considers the factors of importance in judging the degree of illumination in streets, and the means of comparing accurately, based on the measurement of the minimum illumination. 3300 w. Elect'n, Lond—Dec. 15, 1905. Serial. 1st part. No. 74048 A.

## Strong Currents.

A Method for Measuring Heavy Currents (Strommesser für Hohe Stromstärken). Dr. Eugen Nesper. The current is measured by the manner in which it affects iron filings in proximity to a permanent magnet. 1200 w. Elektrotech Zeitschr—Nov. 30, 1905. No. 73855 B.

## Tantalum.

Tantalum and the Tantalum Electric Lamp (Das Tantal und die Tantallampe). Dr. Werner von Bolton. Describing the properties of metallic tantalum, with a brief description of the Siemens & Halske incandescent lamp with tantalum filament. 1500 w. Zeitschr f Elektrochemie—Oct. 27, 1905. No. 73359 G.

## Tantalum Lamp.

The Spherical Reduction Factor of Tantalum Lamps. Dr. Clayton H. Sharp. A series of tests showing that the spherical reduction factor of tantalum lamps varies considerably is discussed, and data relating to the variations are given. Ills. 1600 w. Elec Wld—June 16, 1906. No. 77348.

## Theatre Illumination.

Electric Equipment of a Buffalo Theatre. Describing the arrangement of footlights and border lights dimmers, and

# ELECTRICAL ENGINEERING

## Train Lighting

switchboard for an equipment of more than 5,000 lamps; using a two-wire system. 1000 w. Elec Wld & Engr—Nov. 4, 1905. No. 73074.

Electricity at the New York Hippodrome. An illustrated article showing the extent to which electricity is used in this amusement building, for utilitarian, decorative, and advertising purposes. 3500 w. Elec Wld—May 5, 1906. No. 75542.

## Train Lighting.

See Railway Engineering, Motive Power and Equipment.

## Tungsten.

The Tungsten Lamp. Gives a review of what has been done towards the development of this new lamp, especially work in Europe and the facts relating to the preparation of the filaments. 4000 w. Elec Wld—Sept. 1, 1906. No. 78975.

## Waste.

Waste in Incandescent Electric Lighting and Some Suggested Remedies.

## MEASUREMENT

## Electrical Units

George Wilkinson. Abstract of a paper before the Leeds Loc. Soc. of the Inst. of Elec. Engrs. Notes instances of waste that have come under the writer's notice, suggesting remedies. 4500 w. Elect'n, Lond—Feb. 16, 1906. No. 75278 A.

Waste in Incandescent Electric Lighting and Some Suggested Remedies. Abstract of the discussion in connection with Mr. George Wilkinson's paper on the above subject. 6000 w. Elect'n, Lond—March 16, 1906. No. 75680 A.

Waste in Incandescent Electric Lighting. Refers to methods described in paper by George Wilkinson, and offers suggestions for lessening the waste. 2200 w. Elec Rev, Lond—April 13, 1906. No. 76144 A.

## Wind Power.

Electric Lighting by Wind Power. E. Lancaster Burne. A study of this subject, considering the wind itself, the motor, and the installation as a whole. 5000 w. Elec Rev, Lond—Oct. 19, 1906. No. 80130 A.

## MEASUREMENT

## Bolometer.

Note on the Use of the Bolometer as a Detector of Electric Waves. C. Tissot. Describes investigations. 2000 w. Elec Engr, Lond—March 2, 1906. No. 75499 A.

## Brushes.

The Measurement of the Transition Resistance of Metal-Carbon Brushes (Die Messung der Uebergangswiderstände von Metall-Kohlen-Bürsten). S. Salto. Data and results of tests of brushes, made of carbon containing copper, bronze or other metals to improve the conductivity. 1200 w. Elektrotech Zeitschr—Sept. 20, 1906. No. 79953 B.

## Carbons.

The Determination of the Resistance of Carbons by Using Two Mercury Contacts (Widerstandbestimmung von Kohlen unter Anwendung zweier Quecksilberkontakte). Josef Kuhn. Discussing the determination of the value of lighting carbons by measuring their resistance, with details of the apparatus. 2500 w. Elektrotech Zeitschr—July 12, 1906. No. 78745 B.

## Circle Diagram.

Simple Circle Diagram of the Single-Phase Induction Motor. A. S. McAllister. Shows that when a polyphase induction motor is compelled to operate as a single-phase machine, by cutting one of

the supply wires its current locus is still approximately a circle; but the circle shrinks in diameter about 50%. 2400 w. Elec Wld—June 30, 1906. No. 77755.

## Conductivity.

Measurement of Electrical Conductivity of Short Rods. Rollo Appleyard. Considers the general principles of construction for an instrument designed for making rapid measurements of rods of iron, steel and alloys. 4000 w. Inst of Civ Engrs—No. 3603. No. 79514 N.

## Currents.

Measurement of Feeble High-Frequency Currents. Bela Gati. On the measurement of very feeble telephonic currents outlining a method which does not require a special source of current. 1600 w. Elec Wld—June 30, 1906. No. 77756.

## Diagram.

The General Polyphase Diagram (Das Allgemeine Drehstrom-Diagramm). F. Niethammer. Deriving a polar diagram for the graphical solution of problems relating to generators, motors, transformers and regulators. Two articles, 8000 w. Elektrotech u Maschinenbau—Aug. 12, 19, 1906. No. 79360 each D.

## Electrical Units.

International Conference on Electrical Units. Gives the final decisions of the conference held at Charlottenberg (Ber-

# ELECTRICAL ENGINEERING

## Errors

lin), Germany, in October, 1905. 3500 w. Elec Wld—March 24, 1906. No. 75694.

On the Experimental Determination of the Ratio of the Electrical Units. Lord Rayleigh. Suggestions in regard to the principal determinations, the methods, etc. 1500 w. Elect'n, Lond—Sept. 7, 1906. Serial. 1st part. No. 79226 A.

## Errors.

The Calculation of Percentage Error. H. G. Solomon. Explains the value and meaning of percentage error of an instrument, and gives methods of calculation. 1700 w. Elec Rev, Lond—Oct. 5, 1906. No. 79795 A.

## Frequencies.

The Measurement of Frequencies of Alternating Currents (Verfahren zur Messung von Wechselstrom-Frequenzen). W. Peukert. Describing the use of the method of measuring frequencies by weighing a coil of which the coefficient of self-induction is known. 1800 w. Elektrotech Zeitschr—Aug. 16, 1906. No. 79350 B.

## Galvanometers.

The Alternating-Current D'Arsonval Galvanometer. W. S. Franklin and L. A. Freudenberg. Describes an instrument of the shunt magnet type, said to be almost as sensitive as the direct-current instrument. 800 w. Elec Wld—Sept. 22, 1906. No. 79477.

The Theory of the "Moving Coil" and Other Kinds of Ballistic Galvanometers. Prof. Harold A. Wilson. Develops the proper formulæ for ballistic galvanometers of several types in general use. 1000 w. Elect'n, Lond—Sept. 14, 1906. No. 79456 A.

Factors Determining the Design of Needle Galvanometers. L. A. Freudenberg. Develops the formulas for maximum sensibility in needle galvanometers. 600 w. Elec Wld—Sept. 29, 1906. No. 79546.

The Theory of the "Moving Coil" and Other Kinds of Ballistic Galvanometers. Prof. Harold A. Wilson. Presents the formula usually given for ballistic galvanometers, and also other formulæ for ballistic galvanometers of several types which differ from the first. 1000 w. Elec Rev, N. Y.—Oct. 20, 1906. No. 79881.

## Harmonics.

Graphical Treatment of Higher Harmonics. R. Hellmund. Describes an interesting graphical method for determining the current which flows through impedances of different constants when subjected to a non-sinusoidal electromotive

## MEASUREMENT

## Iron Losses

force. 600 w. Elec Wld—June 30, 1906. No. 77753.

## High Frequency.

The Measurement of High-Frequency Currents and Electric Waves. Abstract of a Cantor lecture by Prof. J. A. Fleming on recent progress in quantitative measurements. Ills. 3500 w. Engng—Dec. 1, 1905. No. 73690 A.

The Measurement of High Frequency Currents and Electric Waves. Prof. J. A. Fleming. Cantor lectures. Explains the methods of measurement used in the writer's investigations, illustrating instruments. 5000 w. Jour Soc of Arts—Dec. 29, 1905. Serial. 1st part. No. 74282 A.

## Induction.

A Method for the Measurement of Self-Induction. Ernest Wilson and W. H. Wilson. Describes a method found convenient in practice. 900 w. Elect'n, Lond Jan. 5, 1906. No. 74405 A.

## Instruments.

Iron-Cored Alternate-Current Instruments. W. E. Sumpner. Abstract of a paper in the *Journal* of the Inst. of Elec. Engrs. (England). Discusses the difficulties in regard to the accurate working of such instruments, the errors due to incorrect phase relations, etc. 3300 w. Elect'n, Lond—Feb. 2, 1906. No. 74989 A.

Some Recent Electrical Measuring Instruments. Kenelm Edgcumbe. A review of recent progress in ampere gauges, wattmeters, photometers, etc. Ills. 3500 w. Elec Engr, Lond—Feb. 9, 1906. Serial. 1st part. No. 75059 A.

## Iron Losses.

A Method for the Determination of Iron Losses in Pole Shoes, Due to Armature Teeth. Thomas F. Wall, and Stanley P. Smith. Describes a method devised by the authors for the direct measurement of such losses. It is based on the fact that the energy consumed is dissipated in the form of heat. Ills. 1600 w. Elect'n, Lond—July 27, 1906. No. 78468 A.

The Measurement of Iron Losses in Asynchronous Polyphase Motors (Messung und Berechnung der Eisenverluste in den Asynchronen Drehstrommotoren). J. Bache-Wig and O. S. Bragstad. Describing the construction of curves for the determination of hysteresis and eddy-current losses. 2000 w. Zeitschr f Elektro-technik—Dec. 3, 1905. No. 73864 B.

The Separation of Iron and Friction Losses in Direct Current Machinery. F. Handley Page. Principally describes a modification of the Kapp method showing

# ELECTRICAL ENGINEERING

## Lamp Testing

results obtained. 900 w. Elec Rev, Lond—Dec. 1, 1905. No. 73681 A.

## Lamp Testing.

The Testing of Incandescent Electric Lamps. Preston S. Millar. Remarks on the fallacies of lamp tests, and precautions to be taken to make the tests of value. 2500 w. Elec Wld—June 16, 1906. No. 77349.

## Magnets.

A Chart for Use in Magnet Design. L. F. Howard. Gives a chart designed to give a quick and convenient means of obtaining the size of wire, or voltage, for different conditions. 1000 w. Elec Jour—July, 1906. No. 78033.

## Magnetization.

Measurement of the Specific Magnetization of Diamagnetic on Slightly Magnetic Bodies. Emile Guarini. Brief description of an apparatus designed by M. P. Curie and M. C. Cheneveau. 1000 w. Sci Am Sup—Nov. 11, 1905. No. 73096.

## Meters.

Meters for Continuous Current, Single Phase, and Polyphase Currents, of the Aron Works at Charlottenburg (Umschaltzähler für Gleichstrom, Ein- und Mehrphasigen Wechselstrom der Elektrizitätszählerfabrik H. Aron in Charlottenburg). A report of tests made by the Reichsanstalt. 1000 w. Elektrotech Zeitschr—Oct. 19, 1905. No. 73348 B.

An Efficiency Meter for Electric Incandescent Lamps. Edward P. Hyde and H. B. Brooks. Describes the theory and operation of an instrument designed and constructed to meet the need of an efficiency meter in the photometric work of the Bureau of Standards. Also editorial. 5200 w. Elec Wld & Engr—Dec. 2, 1905. No. 73613.

An Induction Meter for Alternating Currents (Induktionszähler für Wechselstrom). A report of the Reichsanstalt upon an alternating-current meter of the Siemens-Schuckert Company for currents from 5 to 300 amperes and pressures up to 600 volts; with details of construction. 1500 w. Elektrotech Zeitschr—Dec. 14, 1905. No. 73860 B.

Two New Electrolytic Meters. S. H. Holden. Illustrates and describes two new electrolytic meters, both of which belong to the gas voltometer type, one belonging to the shunted and the other the unshunted class. Short discussion. 3500 w. Elect'n, Lond—Dec. 22, 1905. No. 74144 A.

The Proper Handling of Consumers' Meters. George H. Barrett. Abstract of a paper read before the N. W. Elec. Assn., at Chicago, and of the discussion. Gives suggestions for the care and test-

## MEASUREMENT

ing of meters, and ways of satisfying customers as to their accuracy. 2000 w. Elec Wld—Jan. 27, 1906. No. 74791.

Defective Connections for Three-Phase Meters (Falsche Drehstromzähler Schaltungen). F. Niethammer. A discussion of the importance of using correct connections of the voltage coils of double meters for three-phase currents in order to insure correct measurements. 1200 w. Elektrotech u Maschinenbau—March 18, 1906. No. 76252 D.

Ampere-Hour Meter with Revolving Armature for Continuous Currents (Gleichstrom Amperestundenzähler mit Umlaufendem Anker). E. Beckmann. A discussion of the construction of ampere-hour meters, showing the sources of error and method of computing corrections. 3500 w. Elektrotech Zeitschr—July 12, 1906. No. 78744 B.

A New Induction Watt-Hour Meter. G. Faccioli. Illustrated description and study of the meter recently invented by William Stanley. 2300 w. Elec Wld—June 16, 1906. No. 77350.

Electric Meter Testing. Ernest B. True. Suggestions for the proper testing of meters and discussion of methods. Ills. and tables. 5800 w. Technograph—No. 20. No. 77166 D.

Tests and Certificates of the Electric Testing Bureau (Bekanntmachung über Prüfungen und Beglaubigungen durch die Elektrischen Prüfämter). A report of the Reichsanstalt illustrating a single-phase induction meter accepted for official calibration. 3000 w. Elektrotech Zeitschr—May 24, 1906. No. 77647 B.

Limitations of Three-Wire Energy Motor-Meters. H. G. Solomon. Aims to show that the three-wire energy motor meter correctly measures the energy consumption under certain conditions only. 1200 w. Elec Rev, Lond—Aug. 31, 1906. Serial. 1st part. No. 79129 A.

Test of an Induction Meter for Single-Phase Currents (Induktionszähler mit Clockenanker für Einphasigen Wechselstrom). Report of test by the Reichsanstalt of a new meter by the Siemens & Halske Co. 1500 w. Elektrotech Zeitschr—Oct. 4, 1906. No. 79959 B.

The Kelvin Sector Ammeter and Voltmeter. M. C. Rypinski. Illustrates and describes this meter and states the advantages claimed. 1500 w. Elec Jour—Oct., 1906. No. 79898.

Induction Meter for Alternating Currents of the Danubia Company (Induktionszähler für Wechselstrom der Danubia A. G.). Description of construction and report of tests by the Reichsanstalt. 1500 w. Elektrotech Zeitschr—July 19, 1906. No. 78748 B.

## Meters

# ELECTRICAL ENGINEERING

## Ohm

### Ohm.

Mercurial Standards of Electrical Resistance (*Les Etalons Mercuriel de Résistance Electrique*). C. E. Guillaume. A discussion of the paper of M. Girousse, showing the causes of variations in the resistance of a column of mercury in a glass tube. 5000 w. *Bull Soc Int des Electriciens*—Jan., 1906. No. 75757 G.

Standards for the Legal Ohm (*Les Etalons de l'Ohm Légal*). G. Girousse. An account of the work of the laboratory of the Superior School of Posts and Telegraphs, with especial reference to the production, and comparison of mercury standards for the ohm. 3500 w. *Bull de la Soc Int des Electriciens*—Dec., 1905. No. 75756 G.

### Oscillograph.

An Oscillograph. M. K. Akers. Historical review of the development of this instrument for recording variations of electromotive force or current. Ills. 2000 w. *Technograph*—No. 20. No. 77168 D.

Oscillographs and Some of Their Recent Applications. David A. Ramsay. Calls attention to problems which the oscillograph is particularly well adapted to investigate, giving examples of results obtained. Ills. 3300 w. *Elect'n, Lond*—Sept. 21, 1906. No. 79578 A.

### Oscilloscope.

The Oscilloscope. Dr. Lewis Jones. Calls attention to Ruhmer's ingenious oscilloscope, which makes a graph of the discharge in high potential circuits by mapping the length of cathode rendered luminous by the discharge. Ills. 700 w. *Elect'n, Lond*—March 16, 1906. No. 75679 A.

### Phase Differences.

The Measurement of Phase Differences. Charles V. Drysdale. Considers experimental methods of phase measurements at high power factors, at low power factors and of small differences of phase. Diagrams. 2000 w. *Elect'n, Lond*—Aug. 24, 1906. Serial. 1st part. No. 79003 A.

### Phasemeters.

Phasemeters and Their Calibration. W. E. Sumpner. Showing the method of calibrating the instrument by using direct currents of known values, and thus obtaining deflections corresponding to definite phase angles. 3500 w. *Elect'n, Lond*—Feb. 23, 1906. No. 75366 A.

### Photometer.

The Globe Photometer. An illustrated account of this apparatus, the function of which is to give by one observation the

## MEASUREMENT

## Photometry

value of the whole amount of light emitted by any source, such as an arc lamp, or an incandescent lamp. Information from a paper by Dr. Bloch. 1700 w. *Elec Rev, Lond*—March 16, 1906. No. 75670 A.

A Practical Installation of the Ulbricht Spherical Photometer (*Eine Ausführungsform des Ulbrichtschen Kugelphotometers*). Dr. M. Corsepis. Describing the apparatus at the Cologne Polytechnic. The sphere is two meters in diameter. Data and results of a number of tests are given. 3500 w. *Elektrotech Zeitschr*—May 17, 1906. No. 76859 B.

The Determination of the Hemispherical Intensity of Luminous Bodies (*Zur Berechnung der Hemisphärischen Intensität Körperlicher Lichtquellen*). Dr. H. Heimann. Deriving methods of computing the hemispherical intensity from measurements made of several zones. 3500 w. *Elektrotech Zeitschr*—April 19, 1906. No. 76851 B.

### Photometry.

Reflectors, Shades and Globes. J. R. Cravath and V. R. Lansingh. A report of tests which give information on the photometric performance of common types. Ills. 2000 w. *Elec Wld & Engr*—Nov. 25, 1905. Serial. 1st part. No. 73467.

Some Tests on Lamp Globes. Maurice Solomon. A discussion of results obtained in the course of some experiments on the mean spherical candle-power and distribution of light with Nernst lamps. Also editorial. 3300 w. *Elect'n, Lond*—Nov. 3, 1905. No. 73129 A.

The Theory and Practice of the Spherical Photometer (*Das Kugelphotometer in Theorie und Praxis*). Dr. L. Bloch. A full description of the Ulbricht photometer for the direct measurement of the mean spherical intensity of a source of light, with examples of its application. Two articles. 10000 w. *Elektrotech Zeitschr*—Nov. 16, 23, 1905. No. 73851 each B.

A Portable Selenium Photometer for Incandescent Lamps. Dr. Theo. Torda. Describes an apparatus based upon the action of the light on selenium, which alters its electric resistance with variations, of the intensity of light. 2800 w. *Elect'n, Lond*—April 13, 1906. No. 76193 A.

Experimental Researches in Photometry. (*Untersuchungen auf dem Gebiete der Photometrie*). Karl Satori. A study of the relation of spectroscopy to photometry, showing the importance of comparing lights of corresponding wave lengths. Discussion. 5000 w. *Elektro-*

# ELECTRICAL ENGINEERING

## Potentiometers

tech u Maschinenbau—March 18, 1906. No. 76253 D.

The Measurement of Illumination (Beleuchtungsmessungen). F. Uppenberg. Discussing especially the methods used in the laboratory of the municipal electric station in Munich and the use of the Martens photometer. 1500 w. Elektrotech Zeitschr—April 12, 1906. No. 76258 B.

Some Causes of Error in Photometry. Lancelot W. Wild. Discusses errors due to several causes, and the general principles for the avoidance of angularity error. 1600 w. Elect'n, Lond—July 20, 1906. No. 78296 A.

Apparatus for the Determination of Mean Spherical and Hemispherical Illumination (Versuche mit Hilfsapparaten zur Bestimmung der Mittleren Sphärischen und der Mittleren Hemisphärischen Lichtstärke). Berthold Monasch. Describing the construction and use of the Ulbricht spherical photometer. Two articles. 10000 w. Elektrotech Zeitschr—July 19, 26, 1906. No. 78746, each B.

Color Phenomena in Photometry. J. S. Dow. Read before the Physical Soc. An account of experiments carried out by the writer on an ordinary photometrical bench. 5000 w. Elect'n, Lond—Aug. 24, 1906. No. 79007 A.

Color Phenomena in Photometry. J. S. Dow, before the Physical Soc. of London. Reports an extended investigation made and discusses the results. 4500 w. Elec Rev, N. Y.—Sept. 29, 1906. No. 79543.

The Sources of Error in the Harcourt 10-C.P. Pentane Standard. J. S. Dow. An account of experiments by the author on some of the possible sources of error. 2200 w. Elec Rev, Lond—Sept. 28, 1906. No. 79692 A.

## Potentiometers.

Deflection Potentiometers. H. B. Brooks. Abstract of a paper to be published in the *Bulletin* of the U. S. Bureau of Standards. Describes the principles upon which a deflection potentiometer has recently been constructed and put into service for voltage measurements in photometric work. Ills. 1500 w. Elec Wld—March 17, 1906. No. 75588.

## Power.

The Sale and Measurement of Electric Power. S. B. Storer. Read before the N. Y. State Convention. Considers briefly the cost of production of power from hydro-electric plants and from steam plants and the question of rate making and methods of charging. 3500 w. St Ry Jour—June 30, 1906. No. 77730 C.

## MEASUREMENT

### Resistance.

The Testing of a Low Resistance by Means of Ordinary Laboratory Instruments. G. W. Burley. Describes an attempt made by the author to determine the value of low resistances, when the use of standardized instruments is prohibited. 1800 w. Elec Engr, Lond—June 15, 1906. Serial. 1st part. No. 77473 A.

Experiments on Water Resistances. Karl Wallin. Abstract translation from *Elektrotechnische Zeitschrift*. Gives results of experiments carried out in the Technical High School at Stockholm. 1000 w. Elect'n, Lond—Sept. 7, 1906. No. 79225 A.

Some Experiments with Water Resistances (Einige Untersuchungen über Wasserwiderstände). Karl Wallin. A discussion of errors which may occur in the use of water resistances in tests of electrical machinery. 1800 w. Elektrotech Zeitschr—Aug. 9, 1906. No. 79345 B.

On Methods of High Precision for the Comparison of Resistances. F. E. Smith. Gives a brief account of the high precision methods used at the National Physical Laboratory for measuring standard resistances. 2500 w. Elect'n, Lond—Oct. 5, 1906. Serial. 1st part. No. 79799 A.

### Sparking.

Calculation of Dynamo Sparking Constants. A. Press. Presents empirical formulae apparently not difficult to apply. 1600 w. Elec Wld—March 10, 1906. No. 75485.

### Speed Regulator.

A Controllable Choke Coil for the Magnetic Control of a Speed Meter (Regelbare Drosselspule. Magnetische Einrückungsvorrichtung für einen Um-drehungszähler). E. Gumlich. Illustrating a form of choke coil which may be used to control the resistance of a revolution counter. 2000 w. Elektrotech Zeitschr—Aug. 2, 1906. No. 78,753 B.

### Standards.

The Regulations, Standards, and Specifications of the German Electrotechnical Association (Die Vorschriften, Normen, und Leitsätze des Verbandes Deutscher Elektrotechniker). G. Dettmar. A general description, by the secretary of the association, of the electrical standards and working regulations relating to wiring and installation of machinery. 4000 w. Zeitschr d Ver Deutscher Ing—Oct. 21, 1905. No. 73302 D.

The National Bureau of Standards. S. W. Stratton and E. B. Rosa. Illustrated

# ELECTRICAL ENGINEERING

## Symbols

detailed description of the buildings and equipment and the methods of carrying out the work. 13000 w. *Am Inst of Elec Engrs*—Dec., 1905. No. 74181 D.

The Board of Trade Electrical Standards Laboratory. Deals with the electrical quantities that can be referred to resistance, current, and electromotive force. Illustrates and describes the laboratory and its work. 5500 w. *Engng*—May 25, 1906. No. 77139 A.

## Symbols.

Standard Electrical Symbols (*Einheitliche Formelzeichen*). K. Strecker. A report to the *Elektrotechnischer Verein*, suggesting an elaborate system of standard symbols for physical and electrical magnitudes. 10000 w. *Elektrotech Zeitschr*—May 10, 1906. No. 76857 B.

## Temperature.

Measurement of Temperature by Electrical Means. Edwin F. Northrup. Considers electrical methods of measuring temperature, electrical resistance thermometry, construction of resistance thermometers, slide-wire bridge methods, use of dial or decade Wheatstone bridges, etc. Ills. 770 w. *Pro Am Inst of Elec Engrs*—May, 1906. No. 76939 D.

## Testing.

A Small Motor Testing Equipment. Roy T. Wells. Describes an outfit for factory testing of small electric machines. 1000 w. *Elec Wld & Engr*—Nov. 25, 1905. No. 73468.

Commercial Testing of Electrical Machinery. The "Pump Back" Method. H. B. Foote. Describes the method of testing sets of machines by what is known as the "pump back" or "loss supply" method. Diagrams. 1000 w. *Sib Jour of Engng*—Oct., 1905. No. 73488 C.

Testing Electrical Machinery. An editorial explaining the methods used, especially the Hopkinson test, the Swinburne test, and the method devised by Dr. Charles V. Drysdale. 1400 w. *Elec Rev*, N Y—Dec. 9, 1905. No. 73640.

The Commercial Testing of Small Motors up to 15 B. H. P. Read before the Newcastle Sec. of Inst. of Elec. Engrs. Explains the tests usually made on motors of this size, and describes the apparatus used. 4500 w. *Elec Engr*, Lond—Dec. 15, 1905. Serial. 1st part. No. 74044 A.

The Testing of Electric Generators and Motors. Dr. Charles V. Drysdale. An illustrated explanation of the methods of testing and the construction of the testing plant. 4800 w. *Engng*—Nov. 24, 1905. No. 73599 A.

A Testing Laboratory in Practical Op-

## MEASUREMENT

eration. Clayton H. Sharp. An account of the results attained in the establishment and maintenance of a laboratory for commercial electrical testing. 2800 w. *Am Inst of Elec Engrs*—Dec., 1905. No. 74182 D.

The Electrical Equipment of a D. C. Test Room for an Electricity Supply Undertaking. A. C. Johnson. Illustrates and describes the test room equipment at Burnley, England. 1700 w. *Elec Rev*, Lond—Jan. 19, 1906. No. 74739 A.

Factory Testing of Electrical Machinery. F. Parkman Coffin. Illustrates and describes the work as carried out by the General Electric Company. 3000 w. *Harvard Jour of Engng*—June, 1906. Serial. 1st part. No. 77331 D.

Testing for Central Stations. Clayton H. Sharp. Illustrated description of the Electrical Testing Laboratories of New York and their facilities. 3000 w. *Cent Sta*—June, 1906. No. 77066.

Testing Large Motors, Generators and Motor-Generator Sets. C. J. Fay. The first of a series of articles supplementary to the series on "Factory Testing of Electrical Machinery." 800 w. *Elec Jour*—Aug., 1906. Serial. 1st part. No. 78604.

Accurate Speed, Frequency and Acceleration Measurements. Charles V. Drysdale. A review of the methods of testing in general use. Ills. 2000 w. *Elec Rev*, Lond—Sept. 7, 1906. Serial. 1st part. No. 79219 A.

The Theory of Shop Methods of Testing Direct and Alternating Current Machinery. J. W. Rogers. Gives briefly the tests usually made, and the purposes for which they are made, and the methods of carrying out the various tests. 3000 w. *Elec Engr*, Lond—Oct. 5, 1906. Serial. 1st part. No. 79793 A.

## Time Measurements.

The Practical Application of Electricity to the Determination of Intervals of Time (*Die Praktische Anwendung Direkter Zeitbestimmung im Messwesen der Schwachstromtechnik*). H. C. Steidle. Describing the application of condenser discharges to the measurement of the time action of electric relays. 6000 w. *Elektrotech Zeitschr*—Aug. 16, 1906. No. 79349 B.

## Transformers.

The Testing of Transformers and Transformer Iron. D. K. Morris and G. A. Lister. Abstract of a paper read before the Birmingham Sec. of the Inst. of Elec. Engrs. Describes a diagram found useful in transformer problems, and proposes a standard test involving

# ELECTRICAL ENGINEERING

## Voltage

one set of connections, three instruments, and the normal supply. 3200 w. Elect'n Lond—April 27, 1906. No. 76566 A.

## Voltage.

The Estimation of the Reactance Voltage of Continuous Current Dynamos. H. M. Hobart. Describes a method having the merits of simplicity of the formula and saving in time. 700 w. Elect'n, Lond—April 20, 1906. No. 76439 A.

A Simple Method of Measuring Sparking Voltages. E. A. Watson. Read before the Birmingham Sec. of the Inst. of Elec. Engrs. Gives a method believed to be new, and its chief feature is the entire elimination of any measuring instruments subjected to the working potential, and the consequent simplification of the high-tension circuit. 1500 w. Elec Engr, Lond—June 15, 1906. Serial. 1st part. No. 77474 A.

## Wattmeters.

Series Transformers for Wattmeters.

## MOTORS

## Commutation

Lancelot W. Wild. Explains the object of this arrangement, and discusses the need of careful designing, describing a design for the Westminster Electrical Testing Laboratory. 1800 w. Elect'n, Lond—Feb. 16, 1906. No. 75275 A.

## Weak Currents.

An Improved Measuring Appliance for Weak Alternating Currents (Ein Neues Messgerät für Schwache Wechselströme) W. Voegelé. The current is measured by the rise in temperature of a platinum wire enclosed in a vacuum bulb, using a thermo-electric pile and mirror galvanometer. 1800 w. Elektrotech Zeitschr—May 17, 1906. No. 76858 B.

## Windings.

On the Rapid Calculation of Field Coil Windings. George T. Hanchett. Gives tables useful in facilitating calculations, explaining their application. 1100 w. Elec Wld—Sept. 8, 1906. No. 79198.

# MOTORS

## Alternating.

Electric Traction by Alternating-Current Motors. Dr. Louis Bell. Comparing the alternating and the continuous-current motors, with especial reference to electric traction on main line railroads. 3000 w. Eng Mag—Feb., 1906. No. 74671 B.

The Alternating Series Motor of the Siemens-Schuckert Works (Wechselstrom-Reihenschlussmotoren der Siemens-Schuckertwerke). Rudolf Richter. A complete description of an improved series alternating motor, comparing it with the repulsion motor. Two articles. 10000 w. Elektrotech Zeitschr—June 7, 14, 1906. No. 77652 each B.

Relation of the Alternating-Current Motor to Central Station Business. Reprint of a paper by E. W. Lloyd, read before the Edison Ill. Cos. Calls attention to the necessity of the coöperation of central station men with manufacturers. 3000 w. Elec Wld—Oct. 6, 1906. No. 79679.

## Bearings.

The Inspection of Motors and Motor Bearings. William Kavanagh. Suggestions for determining the clearance between armature and pole pieces, the wear of bearings, etc. 1000 w. Elec Wld—June 2, 1906. No. 77249.

## Brush Holders.

Importance of Effective Brush-Holder Inspection. Henry Schlegel. Explains the functions required of brush-holders and considers the troubles incident to ir-

regularities in the brush gear. 4000 w. St Ry Jour—Sept. 8, 1906. No. 79041 C.

## Care.

The Ill-Treatment of Electric Motors. Considers the causes of breakdowns due to ill-treatment. 1500 w. Mech Engr—Aug. 25, 1906. No. 78993 A.

## Classification.

Electric Motors and Their Applications. W. Edgar Reed. Gives a classification according to their speed-torque characteristics, and a statement regarding their other important operating characteristics, which are useful in making applications. Discussion. Ills. 6400 w. Pro Engrs' Soc of W Penn—Oct., 1905. No. 72980 D.

The Classification of Alternate-Current Motors. V. A. Fynn. Proposes a classification for these alternate-current commutator machines, which the author believes to have a rational basis. 4800 w. Diagrams. Elect'n, Lond—May 25, 1906. Serial. 1st part. No. 77128 A.

## Comparison.

Comparison of Two- and Three-Phase Motors. Bradley McCormick. Gives a comparison of the distribution factor, flux-variation factor, current density in rotor and stator, and the leakage factors. 1500 w. Pro Am Inst of Elec Engrs—June, 1906. No. 78041 D.

## Commutation.

Commutation in Single-Phase Motors at Starting. Marius Latour. A mathe-



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mathematical study of commutation when resistance leads are used. 2000 w. *Elec Wld*—March 10, 1906. No. 75484.

Commutation in a Four-Pole Motor. J. K. Catterson-Smith. Reports results of investigations made with a view to recording by means of the oscillograph the actual manner in which the current is reversed during commutation. Diagrams. 2400 w. *Elec Engr*, Lond—Aug. 24, 1906. No. 78997 A.

## Construction.

See Electrical Engineering, Generating Stations.

## Continuous Current.

The Use of Shunt, Compound, and Series-Wound Motors. F. W. Holbrook. Aims to give a clear understanding of the fitness and unfitness of the various types of windings with respect to the duty to be performed. 3000 w. *Engr. U. S. A.*—Jan. 15, 1906. No. 74479 C.

Continuous Current Motors. J. W. Burleigh. Gives a short description of a two-pole magnet system and some comparative designs. Diagrams. 1500 w. *Elec Rev*, Lond—June 8, 1906. No. 77383 A.

## Control.

Automatic Control for Large Direct-Current Motors. H. D. James. An illustrated description of a controller capable of handling a motor of 900 h. p. and its behavior under test. 1200 w. *Elec Jour*—Jan., 1906. No. 74537.

Methods of "Changing Speed" in Electric Motor Driving. E. Kilburn Scott. An illustrated discussion of the methods in use, both mechanical and electrical. 2000 w. *Ir & Coal Trds Rev*—Jan. 12, 1906. No. 74530 A.

## Cranes.

Crane Motors and Controllers. Claude W. Hill. Gives some of the more common methods of specifying, and the method of calculation to ascertain the load and time which shall produce a rise in temperature equal to that produced in the usual way of working, discussing the requirements of controllers. Tables and diagrams. 4000 w. *Inst of Elec Engrs*—Feb. 8, 1906. No. 75061 D.

## Direct-Current.

Care of Direct-Current Motors. John Howatt. Calls attention to the troubles due to dirt and dampness, the causes of sparking, etc. 2000 w. *Power*—June, 1906. No. 76750 C.

## Hunting.

Hunting Action of Direct-Current Interpole Motors (Pendelerscheinungen an Gleichstrommaschinen mit Hilfs-

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polen). W. Siebert. Discussing the conditions under which auxiliary poles may produce oscillations. 1200 w. *Elektrotech Zeitschr*—May 31, 1906. No. 77650 B.

## Induction Motors.

Notes on Alternate-Current Induction Motors. T. Harding Churton. Compares the performance and characteristics of motors provided with short-circuit and with wound rotors respectively; the performances of such motors on single-phase and polyphase circuits; and indicates the effect of frequency of alternations on the working of such motors. 4300 w. *Elec Engr*, Lond—Oct. 27, 1905. No. 73002 A.

Core Losses in Induction Motors. R. E. Hellmund. Gives a method for determining the core losses for motors with phase-wound secondaries. 400 w. *Elec Wld & Engr*—Dec. 23, 1905. No. 74028.

Induction Motor Characteristics by the Vector Diagram. H. C. Specht. Gives a practical example of the use of the vector diagram in working up the characteristics of an induction motor. 1000 w. *Elec Jour*—Dec., 1905. No. 74075.

The Practical Application of the Heyland Diagram for Induction Motors. W. C. Way. Gives description of the use of the "circle diagram" in design of induction motors, with figures and tables. 1500 w. *Elec Wld & Engr*—Dec. 23, 1905. No. 74027.

A Contribution to the Theory of the Single-Phase Induction Motor. Val A. Fynn. A study of the theory of the asynchronous single-phase induction motor, showing the reasons for its operation and its relation to the continuous-current motor. 2300 w. *Elec Rev*, Lond—Feb. 9, 1906. Serial. Part I. No. 75081 A.

Armature Reaction in Polyphase Motors (Ankerrückwirkung in Drehstromgeneratoren). J. K. Sumec. Deriving formulas for computing the excitation, with practical applications to the design of motors. Two articles. 6000 w. *Elektrotech u Maschinenbau*—Jan. 21, 1906. No. 75143 Each D.

Magnetic Field in the Induction Motor. A. S. M'Allister. Quotes statements made in an article published in this *Journal* in Nov., 1904, and discusses the facts upon which the statements are based, to show that the space distribution of the revolving magnetic flux follows a line law, and to outline a method by which the implied considerations can be utilized in the treatment of induction motor phenomena. 3500 w. *Sib Jour of Engng*—Feb., 1906. No. 75270 C.

The Magnetism in Induction Motors. H. F. and H. W. Connell. Gives an out-

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line of an investigation undertaken to determine how nearly the present commercial induction motor follows the theoretical laws regarding the impressed e. m. f. wave form and its relation to the resultant wave form of the flux; also editorial. 1800 w. *Elec Wld*—Feb. 24, 1906. No. 75266.

Winding Faults in Induction Motors. E. B. Raymond. Shows how by taking simple readings the winding condition can be determined and a correction applied. 1700 w. *Engr, U S A*—Feb. 15, 1906. No. 75058 C.

Repulsion Induction Motor. Maurice Milch. Explains the action of this motor, supplementing the explanation with characteristic curves obtained from tests on motors built for commercial purposes. 3000 w. *Am Inst of Elec Engrs*—Feb., 1906. No. 75343 D.

Graphic Representation of Induction Motor Phenomena. A. S. McAllister. Aims to show that the primary current cannot be accurately represented by any circle, but that the secondary current locus is a true circle. Also editorial. 3000 w. *Elec Wld*—April 21, 1906. No. 76185.

Starting Torque of Induction Motors. R. E. Hellmund. Deals with the predetermination of the commercial starting torque. Also editorial. 1800 w. *Elec Wld*—March 31, 1906. No. 75888.

The Separation of the Losses in Induction Motors. G. W. O. Howe. Reviews methods suggested by Benischke, and by Messrs. Bragstad and La Cour and the experiments of Herr Bache-Wüg. 1400 w. *Elect'n, Lond*—March 30, 1906. No. 76008 A.

Simple Circular Current Locus of the Induction Motor. A. S. McAllister. Discusses the use of the simple circular locus of the primary and secondary currents of the motor for determining the complete performance of the machine. 1300 w. *Elec Wld*—May 26, 1906. No. 76976.

Locating Faults in Induction Motors. E. B. Raymond. Calls attention to certain characteristics of the induction motor, and discusses troubles that sometimes prove annoying and puzzling. 1800 w. *Engr, U S A*—Jan. 15, 1906. No. 74477 C.

The Exciting Current of Induction Motors. A. S. McAllister. Brief outline discussion calling attention to the fact that the value of the wattless component may be ascertained directly from the volume of the air-gap, and the volume of the core material, without reference to the required magnetomotive force, the number or the distribution of the primary

coils. 800 w. *Elect'n, Lond*—June 8, 1906. No. 77379 A.

The Effect of Voltage and Frequency Variations on Induction Motor Performance. Gerard B. Werner. An analysis dealing with the effects on the motor performance caused by variations in the supply circuit. 2500 w. *Elec Jour*—July, 1906. No. 78032.

Magnetic Field in the Single-Phase Induction Motor. A. S. McAllister. A discussion of the characteristics of the single-phase induction motor, giving diagrams. 3500 w. *Elec Wld*—Aug. 18, 1906. No. 78656.

Magnetizing Currents in Polyphase Induction Motors. R. E. Hellmund. Showing that the secondary reaction causes a non-sinusoidal current to flow in the primary winding, when a sinusoidal e. m. f. is impressed upon the primary. 600 w. *Elec Wld*—Aug. 18, 1906. No. 78657.

The Circle Diagram and Design of Induction Motors. A. Miller Gray. Shows that, assuming the semi-circular diagram of the induction motor, it is easy to compute and lay off the semi-circle for any size and speed of induction motor. 900 w. *Elec Wld*—Aug. 11, 1906. No. 78525.

Is the Circle Diagram for Asynchronous Induction Motors Applicable for Oversynchronism? (Gilt das Kreisdiagramm für Asynchrone Wechselstrommaschinen auch bei Ubersynchronismus). L. Lombardi. Results of tests at various speeds, showing that the circle diagram holds good at all speeds. 3000 w. *Elektrotech u Maschinenbau*—Sept. 30, 1906. No. 79965 D.

## Interpole.

The Reincarnation of an Electrical Idea. Frank J. Sprague. An explanation of the value of the inter-pole motor in connection with direct-current operation. 2000 w. *Elec Wld*—Feb. 24, 1906. No. 75265.

The Auxiliary-Pole Type of Motor. J. M. Hipple. The effect of the auxiliary field in producing sparkless commutation, the efficiency of the auxiliary-pole motor, etc., are discussed. 1200 w. *Elec Jour*—May, 1906. No. 76704.

Tests of an Interpole Railway Motor. G. Herbert Condit. Gives characteristic curves of a 35 H. P. interpole motor showing its remarkable performance when operated under weak field conditions. Also the possibilities of control. 700 w. *St Ry Jour*—May 26, 1906. No. 76964 C.

# ELECTRICAL ENGINEERING

## Iron Losses

The Advantages of the Inter-Pole Design in Railway Motors. G. Herbert Condict. A statement of the advantages of this type of motor in direct-current-practice, illustrating graphically some features. 900 w. *St Ry Jour*—April 21, 1906. No. 76174 C.

The Application of the Auxiliary-Pole Type of Motor. J. M. Hipple. An explanation of how a motor of this type makes a saving in the lay-out and operation of the industrial power plant and its distributing system. Diagrams. 1200 w. *Elec Jour*—June, 1906. No. 77315.

Notes on Interpole and Compensated Machines (Einiges über Wendepolmaschinen). E. Arnold. Discussing the number and arrangement of the intermediate poles to produce the best economy of material, with a minimum of operative losses. 3000 w. *Elektrotech Zeitschr*—Aug. 2, 1906. No. 78752 B.

The Influence of Interpoles upon the Design of Continuous-Current Motors (Betrachtungen über den Einfluss des Wendepoles auf den Entwurf Normaler Gleichstrommaschinen). W. Oelschläger. Showing the increase in capacity and general structural advantages obtained by the use of interpoles. 3000 w. *Elektrotech Zeitschr*—Aug. 23, 1906. No. 79352 B.

Direct-Current Motor Design as Influenced by the Use of the Inter-Pole. C. H. Bedell. An explanation of the advantages gained by use of inter-poles. 2400 w. *Pro Am Inst of Elec Engrs*—June, 1906. No. 78043 D.

The Design of Continuous-Current Dynamo Electric Machinery with Interpoles. Gives a brief bibliography of recent articles dealing with this subject. 4200 w. *Elect'n, Lond*—Sept. 28, 1906. No. 79695 A.

## Iron Losses.

Iron Losses in Single-Phase Commutator Motors. Prof. Dr. F. Niethammer. Describes a simple experiment performed to ascertain in just what manner the iron loss varies with the speed. Diagrams. 700 w. *Elec Wld*—March 24, 1906. No. 75693.

See Electrical Engineering, Electro Physics.

## Motor Design.

Design of a Battery Motor. Clarence W. Coleman. Illustrates and describes a motor designed by the writer for operating railroad semaphore signals, though capable of application to other uses. 2000 w. *Am Elect'n*—Dec., 1905. No. 73566.

## Motor Standards.

Standard Conditions for the Use of

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## Shunt Motors

Motors in Connection with Public Electric Stations (Normale Bedingungen für den Anschluss von Motoren an Öffentliche Elektrizitätswerke). L. Schuler. A review of the proposed regulations of the German Electrotechnical Association relating to the conditions under which electric motors may receive current from municipal lighting stations. 2500 w. *Elektrotech Zeitschr*—April 12, 1906. No. 76257 B.

## Polyphase Motors.

The Application of Condensers in the Operation of Polyphase Motors (Anwendung der Kondensatoren bei Dauernem Betrieb von Drehstrommotoren). J. Dalemont. Describing a method of operating three-phase motors from a single-phase main. 3000 w. *Elektrotech Zeitschr*—Nov. 2, 1905. No. 73354 B.

## Pulleys.

Dynamo and Motor Pulleys. T. D. Lynch. An illustrated article presenting some of the features of a set of specifications for pulleys recently adopted by the Westinghouse Elec. & Mfg. Co. 1500 w. *Elec Jour*—Oct., 1906. No. 79899.

## Railway Motors.

A 75 Horse Power Continuous Current Railway Motor for High Voltages (Ein 75 P. S. Gleichstrom Bahnmotor für Hochspannung). H. Rikli-Kehlstadt. Details of windings for a continuous-current motor to be operated at 1,500 volts; with curves and tables of its performance. 2000 w. *Schweiz Bauzeitung*—Nov. 25, 1905. No. 73871 B.

Shunt-Wound Tramway Motors. A. Johnston. Some points on the working of shunt-wound motors, especially in tramway service. 2200 w. *Elec Engr, Lond*—Dec. 1, 1905. No. 73679 A.

## Regulation.

The Voltage Regulation of the Continuous-Current Dynamo. H. M. Hobart. Describes a satisfactory method of predetermining the regulation of continuous-current dynamos, chiefly by reference to the 550-K. W. dynamo. 1400 w. *Elec Rev, Lond*—Aug. 24, 1906. No. 79000 A.

## Repulsion.

A Modified Repulsion Motor. Gives a modified method of connecting up a repulsion motor, as suggested by F. Punga, in the *Elektrotechnische Zeitschrift*. 1500 w. *Elec Rev, Lond*—June 8, 1906. No. 77384 A.

## Rolling Mills.

See Mining and Metallurgy, Iron and Steel.

## Shunt Motors.

A Graphic Method of Determining the Ratio of Speed-Voltage Variation in

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## Single Phase

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## Single Phase

Shunt Motors. A. E. Kennelly. Shows how the speed-voltage may be determined graphically when the usual data concerning the magnetic and electric circuits are available. 2000 w. Elec Wld—June 23, 1906. No. 77466.

### Single Phase.

The Arrangement of Windings in Single-Phase Motors (Die Zerlegung der Amperewindungen des Einphasenmotors). Adolf Thomälen. A general study of the theory of the single-phase motor, with analytical and graphical investigation of the windings of rotor and stator. Two articles. 12000 w. Elektrotech Zeitschr—Dec. 7, 14, 1905. No. 73856 each B.

Alternating-Current Commutator Motors. (Wechselstrom-Kommutator motoren). F. Niethammer. A mathematical examination of the various types of single-phase commutator motors, with diagrams showing sparking pressures and operative relations. Two articles. 3000 w. Elektrotech u Maschinenbau—Jan. 1, 7, 1906. No. 74658 each D.

A Study of a Single-Phase Series Motor. George I. Rhodes. Illustrated report of test made. 2000 w. Tech Qr—Dec., 1905. No. 74587 E.

Notes on the Application of the Single-Phase Motor for Traction Service (Beitrag zum Entwurf von Einphasenseriennmotoren für Bahnzwecke). Emil Dick. A comparison of the advantages of the single-phase alternating motor with the continuous current motor for railways. Serial. Part I. 2500 w. Elektrotech u Maschinenbau—Jan. 7, 1906. No. 74662 D.

A New Single-Phase Commutator Motor. V. A. Fynn. Illustrated description of a motor that can be built with either shunt or series characteristic. 12700 w. Inst of Elec Engrs—March 8, 1906. No. 75591 D.

Circle Diagram of Compensated Series Single-Phase Motor. E. C. Stone. Outlines the construction of the circle diagram. Editorial comment, 2500 w. Elec Wld—March 24, 1906. No. 75692.

Comparative Investigations of a Collector Motor (Verleichende Untersuchungen an einen Kollektormotor). R. Czepek. Data and results of tests of a seven horse power four-pole single-phase series motor. 3500 w. Elektrotech u Maschinenbau—March 11, 1906. No. 75749 D.

The Action of Single-Phase Collector Motors with Reference to Short-Circuiting under the Brushes (Das Verhalten des Einphasen-Kollektormotors unter Berücksichtigung der Kurzschlussströme unter den Bürsten). Dr. Max Breslau.

An elaborate discussion of the single-phase motor, using the analysis of the circle diagram. 8000 w. Elektrotech Zeitschr—April 26, 1906. No. 76854 B.

See also Street and Electric Railways.

Calculation of the Characteristic Curves of the Single-Phase Series Commutator Motors. Prof. O. S. Bradstad and Stanley P. Smith. Shows how a point-by-point method has been used to determine the characteristics of a motor when both the saturation of the iron and the effect of the currents in the short-circuited sections are taken into account. 2000 w. Elect'n, Lond—Oct. 12, 1906. Serial. 1st part. No. 80049 A.

Note on the Tractive Effort of the Single-Phase Commutator Motor Equipment. B. G. Bergman. Discusses the effect of the pulsating torque, which is characteristic of these motors, giving test results and conclusions. 1700 w. Elec Wld—Oct. 13, 1906. No. 79771.

Some Points About Single-Phase Motors. W. Langdon-Davies and B. O. Hawes. Read before the Birmingham and District Elec. Club. The types of motors dealt with are those used on ordinary single-phase circuits, supplying current for lighting and power. Reviews the motors used in this service, and considers the properties essential to a good single-phase motor, etc. 3800 w. Elect'n, Lond—Oct. 19, 1906. No. 80132 A.

The Development of Single-Phase Motors. Leonard J. Pumphrey. Brief review of the development with description of types. Ills. 1800 w. Elec Rev, Lond—Aug. 10, 1906. No. 78665 A.

Alternating-Current Commutator Motors (Ueber Wechselstrom-Kommutatormotoren). F. Eichberg. A comparison of the series motor with the compensated repulsion motor. 4000 w. Elektrotech Zeitschr—Aug. 16, 1906. No. 79351 B.

Calculation of Starting Apparatus for Single-Phase Induction Motors. Suggests a simple graphical method for the predetermination of the starting torque, and for a rational calculation of the starting phase and starting apparatus in the single phase induction motor without commutator. 1800 w. Elec Rev, Lond—Aug. 24, 1906. No. 79001 A.

Commutation in Single-Phase Motors at Starting. Marius Latour. Gives a mathematical and a graphical representation. 1000 w. Elec Wld—Sept. 8, 1906. No. 79199.

The Theory of Single-Phase Commutator Motors, with Reference to Leakage (Die Theorie der Einphasigen Kommutatormotoren mit Berücksichtigung

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### Speed Control

der Streuung). Dr. A. Thomälen. A mathematical analysis of the losses in single-phase motors, reviewing the discussion of Sumec. 2500 w. *Elektrotech u Maschinenbau*—Sept. 9, 1906. No. 79363 D.

See Also Street and Electric Railways.

### Speed Control.

A Graphic Method of Showing the Action of Auxiliary Pole Variable-Speed Motors. Norman G. Meade. Diagrams and description. 300 w. *Elec Wld*—March 17, 1906. No. 75589.

Speed Characteristics and the Control of Electric Motors. Charles F. Scott. Discussing especially the practical methods of speed control of direct-current motors as applied to the driving of machine tools. 5000 w. *Engineering Magazine*—April, 1906. No. 75787 B.

The Lincoln Variable Speed Motor. Illustrated description of a four-pole shunt motor with the shunt field windings connected in series. 900 w. *Ir Age*—March, 1906. No. 75300.

Speed Characteristics and the Control of Electric Motors. C. F. Scott. Mr. Scott's second paper treats of practical applications of alternating-current motors to the driving of machine tools; with numerous illustrations of working installations. 3000 w. *Engineering Magazine*—May, 1906. No. 76274 B.

The Adaptability of Variable Speed Motors. Explains the advantages of the plain variable speed motor. 1000 w. *Elec Rev, Lond*—March 30, 1906. No. 76005 A.

Direct Current Motor Speed Control. J. H. Newby. Read before the Elec. Assn. of N. S. W. Discusses methods

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### Cable Tests

of varying the speed of direct current motors, including the multiple voltage of three-wire balance system. 2200 w. *Aust Min Stand*—May 23, 1906. Serial. 1st part. No. 77780 B.

### Standardization.

Standardization of Direct-Current Traction Motors. A translation of the Committee report presented at the International Congress of Tramways at Milan. 1800 w. *Elec Wld*—Oct. 13, 1906. No. 79772.

### Testing.

See Electrical Engineering, Measurement.

### Unipolar.

The Unipolar Machine as a Single-Phase Alternating-Current Motor (Die Unipolar Maschine als Einphasen-Wechselstrommotor). Josef Huppert. A brief examination of the operation of the acyclic dynamo, and the applicability of the machine to operation by single-phase currents. 1000 w. *Elektrotech u Maschinenbau*—March 4, 1906. No. 75747 D.

### Windings.

The Calculation of Polyphase Induction Motor Windings. F. T. Chapman. Indicates a rapid method of determining approximately the most suitable winding from the standpoint of the power factor and overload capacity, for a motor whose mechanical dimensions are already fixed. 600 w. *Elect'n, Lond*—May 18, 1906. No. 76990 A.

### Wiring.

The Wiring and Maintenance of Shunt and Compound-Wound Motors. William Kavanagh. Considers the wiring and care of both types. Ill. 1000 w. *Elec Wld*—April 7, 1906. No. 76088.

## TRANSMISSION

### Analogy.

Belt Transmission of Power as an Analogue of Electric Transmission. Byron B. Brackett. Develops an analogy between the electric transmission and the belt drive. Also editorial. 3500 w. *Elec Wld & Engr*—Dec. 9, 1905. No. 73666.

### Arresters.

Protective Apparatus. N. J. Neall. Illustrates and describes the principal forms of arresters used on the Continent. 1200 w. *Elec Jour*—Dec., 1905. No. 74076.

Some Experiences with Lightning and Static Strains on a 33000 Volt Transmission System. Farley Osgood. Explains

the actions of the multigap series resistance type of arrester unit, and the multigap type of arrester unit without the series resistance, experienced during the years 1904 and 1905 on a system in Connecticut. Ills. 3000 w. *Pro Am Inst of Elec Engrs*—June, 1906. No. 78044 D.

The Benefit of Enquiry in Lightning-Arrester Practice. N. J. Neale. Discusses needed investigation of lightning-protection apparatus, and the information available concerning the performance of apparatus now in use. 3500 w. *Elec Rev, N Y*—Sept. 8, 1906. No. 79050.

### Cable Tests.

Tests of an Armored Cable for Three-

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## Cables

Phase Current at 27,000 Volts (Essais d'un Cable Armé pour Courant Triphasé à 27,000 Volts). Data and results of tests upon a transmission cable between En-traygues and Toulon, under tensions as high as 90,000 volts, for a working tension of 27,000 volts. 1200 w. Génie Civil—Feb. 17, 1906. No. 75714 D.

## Cables.

Admissible Limits of Pressure for Armored Cables (Limites Admissibles pour les Tensions de Service des Cables Armés). M. de Marchena. A review of practical experiences showing the successful use of pressures up to 22,000 volts. 7000 w. Bull Soc Int des Electriciens—April, 1906. No. 76863 G.

## Circuits.

Transmission Circuit. Charles F. Scott. An elementary consideration of self-induction, regulation and mutual induction. The first of a series of articles treating generally of induction and capacity in electric circuits. 4500 w. Elec Jour—Dec., 1905. No. 74072.

## Direct Current.

Long Distance Power Transmission by Direct Current. Frank J. Sprague. Discusses the economic side of direct-current transmission, referring to the Victoria Falls project. Also editorial. 3800 w. Elec Wld & Engr—Dec. 30, 1905. No. 74164.

The New Power Supply for the City of Lyons, France. C. T. Wilkinson. An illustrated account of an interesting 60,000-volt direct-current transmission over a distance of 110 miles. Also editorial. 4000 w. Elec Wld—Oct. 20, 1906. No. 80019.

## Earth.

Use of the Earth in High-Tension Transmissions. Emile Guarini. An account of the results obtained by M. Thury and the French commission of electricians, with remarks. 1600 w. Sci Am Sup—Dec. 30, 1905. No. 74063.

## High-Tension.

A Pertinacious Current; or the Storage of High-Tension Electricity by Means of Valves. Sir Oliver Lodge, before the Royal Inst. of Gt. Britain, explains this method of securing and maintaining a continuous high-tension current, and some uses to which it may be applied. 3500 w. Sci Am Sup—Jan. 13, 1906. No. 74390.

Electric Mains for Power Transmission Work. Prof. John T. Morris. Read before the Junior Inst. of Engrs. A brief account of some of the main considerations which affect high-tension transmission. Deals with the apparatus used for

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## Lightning Arresters

transmission of currents at voltages from 5000 to the maximum voltage used. 4500 w. Elec Engr, Lond—Dec. 29, 1905. Serial. 1st part. No. 74287 A.

## High Voltage.

100,000-Volt Experimental Transmission Line. K. Wernicke. Illustrates and describes an experimental line near Berlin, which has been tested and successfully proven that an installation operating at 100,000 volts is feasible when properly insulated. 1700 w. Elec Wld—July 14, 1906. No. 77961.

## Insulators.

The Samenza Porcelain Insulator at the Milan Exhibition. Illustrates and describes a new insulator devised and perfected by Italian engineers. 1000 w. Elec Rev, Lond—Aug. 31, 1906. No. 79131 A.

## Lightning.

High-Tension Lightning Protection. C. R. McKay. Read before the Cent. Elec. Ry. Assn. Considers the principal high-tension, alternating-current protective devices in present use, and their performance. 2500 w. Elec Ry Rev—Oct., 1906. No. 79656.

## Lightning Arresters.

Note on Lightning-Arresters on Italian High-Tension Transmission Lines. Philip Torchis. A report of observations made by the writer and reporting the best practice of to-day for the protection of Italian transmission lines. 800 w. Am Inst of Elec Engrs—Oct., 1905. No. 72925 D.

Performance of Lightning-Arresters on Transmission Lines. N. J. Neall. Describes a method of obtaining, by means of test-papers, records of the operation of lightning-arresters in service; gives some results obtained by the use of this method. Ills. 3500 w. Pro Am Inst of Elec Engrs—Nov., 1905. No. 73485 D.

Shaw's Lightning Arrester. Report of the Committee on Science and the Arts, on the invention of Henry M. Shaw. Ills. 900 w. Jour Fr Inst—Nov., 1905. No. 73097 D.

Some Experiences with Lightning Protective Apparatus. Julien C. Smith. Deals with experiences with lightning protective apparatus which the operating department of the Shawinigan Water & Power Co. has had during the years 1903, 1904 and 1905. Ills. 2000 w. Am Inst of Elec Engrs—Oct., 1905. No. 72924 L.

Earthing Resistances for Lightning Protectors (Erdleitungswiderstände bei Blitzschutzvorrichtungen). Gustav Bernischke. Discussing the advantages of carborundum as a material for resistances, with

# ELECTRICAL ENGINEERING

## Line Measurements

practical details as to its use in connection with lightning arresters. Discussion. 6000 w. *Elektrotech Zeitschr*—May 17, 1906. No. 76862 B.

## Line Measurements.

Measurements on Lines without Using Testing Wires (Ueber Fernspannungsmessung ohne Prüfdrähte). G. Rasch. Describing the use of measuring transformers for the determination of the voltage at the end of a line. 1800 w. *Elektrotech Zeitschr*—Aug. 30, 1906. No. 79355 B.

## Lines.

Long Span Pole Lines. A. J. Bowie, Jr. Discusses how long the spans can advantageously be made, and what stresses are liable to come on the wires. 3300 w. *Elec Wld*—Aug. 5, 1906. No. 78863.

Power Transmission Lines. T. L. Kolkin. Discusses important points in the laying out of transmission lines. 1200 w. *Elec Rev, Lond*—Sept. 14, 1906. Serial. 1st part. No. 79444 A.

## Line Towers.

The Structural Design of Towers for Electric Power-Transmission Lines. Joseph Mayer. Discusses the forces acting on the towers through wind pressure, ice load, and longitudinal forces; the types of foundations, design, &c. Ills. 6500 w. *Eng News*—Jan. 4, 1906. No. 74169.

## Long Distance.

The Electrical Transmission of Power Over Great Distances. S. M. Kintner. Deals principally with the transmission of alternating current. Discussion. 5500 w. *Pro Engrs' Soc of W Penn*—March, 1906. No. 75622 D.

## Losses.

Economical Loss in Electric Transmission. G. R. Henderson. Discusses the cost of excess plant necessary because of line losses. 1200 w. *Am Engr & R R Jour*—Jan., 1906. No. 74101 C.

## Low Frequency.

Stanley's System of Transmitting and Utilizing Low-Frequency Currents. Describes a system in which the principal advantages of alternating-current distribution and direct-current motors are present. Ills. 2000 w. *Sci Am Sup*—June 30, 1906. No. 77713.

## Niagara.

The Niagara-Syracuse Transmission Line. Orrin E. Dunlap. An illustrated description of this long transmission line. 2500 w. *Elec Wld*—April 14, 1906. No. 76157.

## TRANSMISSION

## South Africa

## Overhead.

English Overhead Transmission Lines and Distribution Mains. Gives recent regulations issued by the Board of Trade, and an account of overhead work being carried out. Ills. 2600 w. *Elec Engr, Lond*—Sept. 14, 1906. Serial. 1st

## Poles.

A New System for Line-Wire Poles (Eine Neue Befestigung von Leitungsmasten). S. Herzog. Describing a combination of wooden pole and concrete base, especially adapted for telegraph and electric transmission lines. 2000 w. *Elektrotech u Polytech Rundschau*—June 14, 1906. No. 78188 D.

## Progress.

Power Transmission in 1906. Dr. F. A. C. Perrine. Calls attention to the change of sentiment by financiers for water-power securities; and the problem of the lightning arrester, the insulator problem, &c. 1000 w. *Elec Rev, N Y*—Jan. 13, 1906. No. 74428.

## Protective Apparatus.

Methods of Testing Protective Apparatus. E. E. F. Creighton. Treats of the methods of testing arresters and dielectrics, and gives the conditions and precautions found necessary to obtain useful results. 8000 w. *Pro Am Inst of Elec Engrs*—June, 1906. No. 78045 D.

Protective Apparatus for Lightning and Static Strains. H. C. Wirt. Discusses in detail the methods of protection used for high-tension transmission lines. Ills. 5000 w. *Pro Am Inst of Elec Engrs*—June, 1906. No. 78046 D.

## Protective Devices.

Lightning Protection. Newton Harrison Explains the conditions that cause lightning, and discusses the means adopted to secure immunity from shock or fire. 1800 w. *Cent Sta*—April, 1906. No. 75998.

Discussion on Lightning and Lightning Protective Apparatus. 6800 w. *Am Inst of Elec Engrs*—Dec., 1905. No. 74185 D.

## Rhone.

A Projected Scheme for Transmission of Power from the Rhone to Paris. Information concerning this hydroelectric scheme, which it is believed could be completed in three or four years. 1600 w. *Elec'n, Lond*—Aug. 3, 1906. No. 78549 A.

## South Africa.

The Electrical Transmission of Power from the Victoria Falls to the Rand. Prof. W. E. Ayrton. From *The Times Engng. Sup*. Gives the writer's views in

# ELECTRICAL ENGINEERING

## Superposition

regard to this scheme, and compares them with the views of Mr. Wilson Fox. 2000 w. *Mech Engr*—Nov. 25, 1905. No. 73587 A.

## Superposition.

The Application of the Principle of Superposition to the Transmission of Alternating Currents over a Long Line (*Application du Principe de la Superposition à la Transmission des Courants Alternatifs sur une Longue Ligne*). A. Blondel. Deriving a graphical method, giving a form of diagram for practical use in computing the pressure and current at the end of the line. 1200 w. *Comptes Rendus*—May 7, 1906. No. 76829 D.

## Surging.

Oscillographic Researches on Surging in High Tension Lines. C. David. Abstracted, with introduction by L. A. Herdt. Deals with the subject of surges on transmission lines, giving the results of experiments. Ills. 2200 w. *Can Soc of Civ Engrs*—Nov. 2, 1905. No. 73744 D.

## Temperature Effects.

Temperature Effects in Spans. C. P. Nachod. Showing the relation between the sag and tension in a span where there is a temperature variation. 700 w. *Elec Wld & Engr*—Dec. 7, 1905. No. 73667.

## Three-Phase.

Direct-Current Transmission in Competition with the Three-Phase Alternating-Current System for Milan. Explains the general condition at Milan and the comparison made of the two schemes

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for the supply of power, which resulted in favor of the three-phase system. 800 w. *Elec Rev, Lond*—June 29, 1906. No. 77886 A.

## Towers.

Towers for the Transmission Line between Ballston and Amsterdam, New York. Illustrates and describes the towers being built for a transmission line between Spier Falls and Utica, N. Y. 1000 w. *Elec Rev, N Y*—June, 30, 1906. No. 77736.

## Transmission Circuits.

Induction in Transmission Circuits. Charles F. Scott. An elementary consideration of the physical basis underlying self induction and mutual induction. 3000 w. *Elec Jour*—Feb, 1906. No. 75269.

## Vermont.

Electric Transmission and Distribution in Vermont. An illustrated description of the hydro-electric generating station and sub-stations of the Chittenden Power Company at Rutland. 1500 w. *Am Elect'n*—Dec., 1905. No. 73561.

## Zambesi.

The Zambesi Power Scheme. W. B. Esson. A reply to criticisms, concluding that the undertaking is economically sound providing no difficulties prevent the fulfillment of proposed conditions. 2500 w. *Elec Rev, Lond*—Jan. 12, 1906. No. 74514 A.

The Zambesi Power Scheme. W. B. Esson. Discusses the scheme proposed by H. Wilson Fox. 1700 w. *Elec Rev, Lond*—Dec. 15, 1905. No. 74047 A.

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## Addresses.

Dr. W. M. Thornton's Inaugural Address to the Newcastle Section of the Institution of Electrical Engineers. Abstract. Discusses the science and art of engineering, the education of an engineer, &c. 2500 w. *Elect'n, Lond*—Nov. 24, 1905. No. 73598 A.

Mr. J. M. Munro's Inaugural Address to the Glasgow Section of the Institution of Electrical Engineers. (Abridged.) Historical review of early work and of electricity in civic service. 6000 w. *Elect'n, Lond*—Nov. 24, 1905. No. 73596 A.

S. L. Pearce's Inaugural Address to the Manchester Section of the Institution of Electrical Engineers. (Abridged.) A general survey of the year's work, noting advances made, and the problems yet unsolved. 8000 w. *Elect'n, Lond*—Nov. 24, 1905. No. 73597 A.

The Work of the Institute. Samuel Sheldon. Presidential address before the American Inst. of Elect. Engrs., showing the scope of the Institute's activities, and describing the work of the secretary's office and of the various committees. 3500 w. *Am Inst of Elec Engrs*—Sept. 28, 1906. No. 79507 D.

## Agriculture.

The Application of Electric Motors to Agricultural Purposes. Franz Koester. With numerous practical illustrations of examples in a profitable field for the extension of electric power. 2500 w. *Engineering Magazine*—August, 1906. No. 78192 B.

## Efficiencies.

Efficiencies. James Swinburne. Abstract of an address to the students of the Manchester local section of the Inst. of



## ELECTRICAL ENGINEERING

### Electrical Problems

Elec. Engrs. 3500 w. Elec Rev, N Y—Dec. 30, 1905. No. 74106.

### Electrical Problems.

Unsolved Problems in Electrical Engineering. Col. Rooke Evelyn Bell Crompton. The "James Forrest" lecture, 1905. Treats a few of these problems, referring to some very near solution, and others that will greatly benefit mankind. 11000 w. Inst of Civ Engrs—April 10, 1905. No. 74354 N.

### Electricity.

Electricity in the Home. Harold Standard. An illustrated article describing many applications of electricity to domestic service. 1600 w. Sci Am Sup—June 2, 1906. No. 77048.

### Extension.

Extending the Uses of Electricity. H. S. Knowlton. An illustrated article considering its applications to domestic service. 800 w. Cassier's Mag—June, 1906. No. 77294 B.

### Lectures.

Elementary Lectures on Electrical Engineering. This first of a series of articles explains some of the fundamental principles. 111s. 1200 w. Power—Feb., 1906. Serial. 1st part. No. 74899 C.

### MISCELLANY

#### Paris.

The Future Régime of Electricity in Paris. An explanation of the situation in regard to the supply and distribution of electrical energy. The city is at present supplied by six companies, called the six Sectors, whose concessions are about to expire. 900 w. Elec Rev, Lond—Sept. 14, 1906. No. 79447 A.

#### Review.

The Electrotechnical Industries in the Year 1905 (Die Elektrotechnische Industrie im Jahre, 1905). Emil Honigmann. A general review of the progress of the electrical industry in Europe, with special reference to developments in Austria-Hungary. Tabulated comparisons for 1904 and 1905 are given. Serial. Part I. 4000 w. Elektrotech u Maschinenbau—Jan. 14, 1906. No. 75141 D.

Electrical Development in Europe in 1905. C. L. Durand. A review of progress in the various electrical industries. 2000 w. Elec Rev, N Y—Jan. 13, 1906. No. 74432.

#### Statistics.

The Electric Power Companies. The annual sheet of statistics of the electric power companies of the United Kingdom, with editorial. 3000 w. Elect'n, Lond—Jan. 26, 1906. No. 74878 A.

## INDUSTRIAL ECONOMY

### Accounting.

Cold Storage Accounting. Lamont Brace. Helpful suggestions. 1600 w. Ice & Refrig—Jan., 1906. Serial. 1st part. No. 74281 C.

Method in Engineering Work. A. D. Williams, Jr. Describes a method devised for handling the engineering work, in shop and offices, for a concern building traveling cranes in a wide variety of sizes and types. 6000 w. Ir Age—July 12, 1906. No. 77904.

### Address.

The Unifying of the Republic. Silas G. Comfort. President's address. An interesting review of engineering development and achievement during the last thirty years as introductory to a consideration of the advancement made from 1800 to about 1830, describing conditions of one hundred years ago, the engineering achievements, etc. 7800 w. Pro Engr's Club of Phila—April, 1906. No. 76935 D.

Address of Sir Alexander Richardson Binnie. Reviews the history and growth

of the various branches of engineering, and considers those whose names are associated with its development. 7000 w. Inst of Civ Engrs—Nov. 7, 1905. No. 78016 N.

Engineering Honor. Schuyler Skaats Wheeler. President's address. Discusses the duties of an engineer to his client, the public, to the engineering societies, and gives an appendix on professional ethics. 12000 w. Pro Am Inst of Elec Engrs—June, 1906. No. 78040 D.

Technical Work of the Past and Present (Technische Arbeit Einst und Jetzt). W. V. Oechelhaeuser. A historical review of the development of engineering, being the Presidential Address before the Society of German Engineers. 10000 w. Zeitschr d Ver Deutscher Ing—July 21, 1906. No. 78703 D.

### Agriculture.

Agricultural Machinery in the Beginning of the Twentieth Century (Le Matériel Agricole au Debut du XX Siecle). Max Ringelmann. An exhaustive review

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## American Industries

of the application of engineering to the development of agriculture, including the development of agricultural machinery and appliances during the nineteenth century, and their influence upon the status of agricultural labor, and national economy. 15,000 w. Bull Soc d'Encour—Oct., Nov., 1905. No. 75180 each G.

## American Industries.

Personal Reminiscences of the Past Half-Century. James Christie. Remarks on the industrial conditions in the United States, about fifty years ago. Deals with transportation, iron manufacture, ship and boat building, mining, agriculture, etc. 8500 w. Pro Engr's Club of Phila—April, 1906. No. 76936 D.

## American Trade.

Wake Up, America! Manufacturing Methods which Imperil Our Trade. Dr. Louis Bell. A protest against the methods of excessive standardization which tend to paralyze American trade abroad. 3000 w. Engineering Magazine—Sept., 1906. No. 78770 B.

## Apprentices.

Technical Training and the Apprenticeship Question. (L'Enseignement Professionnel et la Question de l'Apprentissage). M. Alfassa. A study of apprenticeship in France, in connection with technical instruction, giving a summary of the plan for the education of apprentices adopted in France by the Conseil Supérieur du Travail. 8000 w. Bull Soc d'Encour—Nov., 1905. No. 75181 G.

A Modern Adaptation of the Apprenticeship System. O. M. Becker. A review of present methods of training the skilled mechanics of the future, showing their possible adaptability to the average shop. 3500 w. Engineering Magazine—Nov., 1906. No. 79992 B.

## Austria.

Austria and Her Industries. An account of the special aid rendered by the Government for the encouragement of industry, illustrating some of the shops. 2500 w. Engr, Lond—Aug. 31, 1906. No. 79149 A.

## Betterment.

The Rationale of the Industrial Betterment Movement. H. F. J. Porter. Discussing the movement to improve shop conditions, and showing that it will more than pay in the increased efficiency. 3000 w. Cassier's Mag—Aug., 1906. No. 78573 B.

## Bounties.

Bounties for the Canadian Iron and Steel Industry. Edward Porritt. A survey of bounty legislation and bounty pay-

## Coal Trade

ments from 1894 to 1906. 4500 w. Ir Age—Oct. 25, 1906. No. 80085.

## Canals.

The Law of Canals. J. H. Cockburn. A discussion of English law in regard to questions relating to canals. 2200 w. Col Guard—April 6, 1906. Serial. 1st part. No. 76077 A.

The Coal Traffic on French Canals. An account of the conditions under which coal cargoes are carried on the canals of France. 4500 w. Ir & Coal Trds Rev—June 8, 1906. No. 77393 A.

## China.

Anti-Foreign Agitation in China. Editorial discussion of the boycott of American goods and other matters affecting Chinese trade. 2700 w. Eng'ng—Dec. 22, 1905. No. 74153 A.

## Chinese Miners.

Chinese Coolies in the Transvaal. Describes the conditions under which 45,000 Chinese coolies have been collected in China and sent to South Africa to serve as workmen in the mines. Shows the contract has been carried out in an honest manner to the advantage of all concerned. 1700 w. Eng & Min Jour—Jan. 20, 1906. No. 74473.

## Civil Engineers.

Requisites of a Civil Engineer. Gen. William Sooy Smith. Gives some facts of interest from the experience of the writer, and discusses the requisites of a good engineer. 5000 w. Trans Assn of Civ Engrs of Cornell Univ—1906. No. 78037 G.

## Classification.

Classification of Engineering Expenditures. F. H. Newell. Discusses the object and methods of classification. 3000 w. Eng Rec—April 28, 1906. No. 76413.

## Coal Strike.

The Meaning of the Coal Strike in the United States. F. E. Saward. A review of the present actual conditions in the anthracite and bituminous coal fields of the United States and a discussion of the points at issue between the miners and operators in the spring of 1906. 3500 w. Engineering Magazine—May, 1906. No. 76278 B.

## Coal Trade.

The Coal Trade in 1905. Editorial review of the trade of the year in Great Britain. 2000 w. Col Guard—Jan. 5, 1906. No. 74412 A.

Problems of the Expansion of the American Coal Trade. F. E. Saward. A review of recent statistics, showing the enormous growth of the coal trade of the

# INDUSTRIAL ECONOMY

## Commerce

United States, both domestic and export. 2500 w. Engineering Magazine—Dec., 1905. No. 73376 B.

Wages and Profits in the British Coal Trade. T. Good. Gives facts and figures tending to prove that the coal miner receives fair wages, and that the profits are small. 1600 w. Cassier's Mag—March, 1906. No. 75608 B.

## Commerce.

American Commercial Relations: A Coming International Problem. M. A. Oudin. A discussion of the rapidly rising importance of the American export trade and the necessity of adopting improved methods for its development. 4000 w. Engineering Magazine—May, 1906. No. 76271 B.

## Commercial Engineering.

Problems That Confront Engineering and Kindred Industries on the Pacific Coast. George W. Dickie. Read before the Engng Cong., Lewis & Clark Ex. Deals mostly with the commercial problems, stating the conditions to be met. 5000 w. Jour Assn of Engng Socs—Feb. 1906. No. 76115 C.

## Competition.

The Competition of British Coal in the German Market (Der Wettbewerb der Britischen Kohle auf dem Deutschen Markt). W. Viebig. A comparison of output and prices, showing the necessity for lower internal transport charges to enable German coal to compete with British on the coast. Two articles. 8000 w. Glickauf—July 14, 21, 1906. No. 78740, each D.

## Contracts.

The "Indiana" Claim in the Court of Claims. George A. King and William B. King. A review of this suit which is of importance to contractors with the U. S. Government. 2400 w. Eng Rec—Feb. 17, 1906. No. 75056.

The Legal Effect and Construction of a Contract for Large Works. Considers some of the more important provisions which usually appear in large contracts, discussing the provisions of certain clauses which would be sufficient to cover every contingency. 5300 w. Engng—Oct. 12, 1906. No. 80054 A.

Government Contracts; Legal Pitfalls and How to Avoid Them. George A. King and William B. King. Gives the rules of importance in guiding contractors entering into contracts with the United States, in the present number. 3500 w. Eng Rec—Dec. 16, 1905. Serial. 1st part. No. 73917.

## Co-operation.

Co-operation. Henry W. Thornton.

## Development

Read before the Traffic Club of Pittsburgh. Especially considers co-operation between the traffic and operating departments of the same railroad, and co-operation between a railroad and an industry. 5500 w. Pro St Louis Ry Club—June 8, 1906. No. 77768.

Useful Co-operation. W. C. Kerr. Read at meeting of the district managers of the Westinghouse Electric & Mfg. Co. Considers the essentials of co-operation and the things that make it difficult. 4000 w. Elec Jour—Dec., 1905. No. 74073.

## Copper Trade.

Annual Review of the American Copper Trade. Horace J. Stevens. Brief review of this industry in the United States, from its earliest origin, with particulars of the production during 1905. 4000 w. Min Wld—Jan. 6, 1906. No. 74232.

Annual Review of the World's Copper Trade. Horace J. Stevens. Reports the largest yearly production ever known, with much interesting information. 3500 w. Min Wld—Jan. 13, 1906. No. 74370.

The World's Copper Trade in 1905. Horace J. Stevens. A review of the year showing much the largest production of copper ever known. 4500 w. Min Wld—Jan. 27, 1906. No. 74777.

## Costs.

The Estimation of Costs. Abstract of a paper by A. W. Farnsworth, read before the Coventry Engng. Soc. Interesting suggestions concerning the employment of better men for cost-keeping. 2500 w. Eng Rec—Feb. 3, 1906. No. 74864.

The Estimation of Costs. A. W. Farnsworth. Read before the Coventry Engng. Soc. Discusses methods of estimating, the essentials of accuracy, considering briefly how an estimate should be made. 4500 w. Engr, Lond—Jan. 19, 1906. No. 74758 A.

Cost Keeping on Public Works. Waldo S. Coulter. Suggestions with remarks on what the reports should show. 1000 w. Eng News—June 14, 1906. No. 77438.

A Tool for Cutting Down Costs. F. E. Webner. The first of a series of twelve articles on cost keeping. 3000 w. Ir Trd Rev—July 5, 1906. No. 77807.

## Development.

Industrial Development. Explains a scheme in connection with the development of the North-Eastern districts, England, with the object of establishing new industries, where rates are low and electric power cheap, and where railway and water facilities are abundant. Maps. 1500 w. Elec Rev, Lond—April 27, 1906. No. 76560 A.

## INDUSTRIAL ECONOMY

### Dumping

The Development of the West. C. A. Cairns. Extracts from an address at a meeting of the Int. Assn. of Ticket Agents. Historical review of the progress and causes that have contributed to the wonderful growth. 1500 w. Ry Age—Sept. 7, 1906. No. 79074.

### Dumping.

Some Dumping Dodges. William Taylor Heslop. Illustrated description of devices used in South Africa for loading and unloading material. 1200 w. Mines & Min—July, 1906. No. 77909 C.

### Education.

Factory Education. O. M. Becker. An introductory article discussing the education of factory operatives. 2500 w. Mach, N Y—Dec., 1905. Serial. 1st part. No. 73527 C.

Laboratory Courses in Engineering Schools. Prof. D. S. Jacobus. Quotes from paper by Prof. Charles E. Lucke, before the A. S. M. E., and gives the discussion presented by the writer, which describes the work at Stevens Inst. 5000 w. Stevens Ind—Oct., 1905. No. 73929 D.

Teaching Agricultural Engineering in Land Grant Colleges. C. J. Zintheo. Shows the need of a complete course of agricultural engineering and what it should include, comparing the United States, with European countries, to the former's disadvantage. Especially discusses the need of instruction in the use and care of farm machinery. 2500 w. Eng News—Dec. 21, 1905. No. 73980.

Is Amalgamation a Failure? L. H. Chandler. A very full exposition of the engineering training given at the Naval Academy in Annapolis. Ills. 3600 w. Pro U S Naval Inst—Dec., 1905. No. 74717 G.

A Municipal School of Marine Engineering. Editorial on the Poplar School, recently opened in London. 2800 w. Engng—Jan. 26, 1906. No. 74895 A.

Investigations and Commercial Tests in Connection with the Work of an Engineering College. Prof. D. S. Jacobus. Address before the Am. Assn. for the Adv. of Science. Presents the advantages and disadvantages of research work and outside work. 3200 w. Am Mach—Vol. 29. No. 6. No. 74937.

Laboratory Training. C. H. Benjamin. An illustrated article discussing the aim of laboratory work and how best to make the work of benefit. Describes briefly the power laboratory of the Case School, indicating how it is being used. 2000 w. Mach, N Y—Feb, 1906. No. 74800 C.

### Education

The Application of Science to Industry. Editorial review of the Final Report of the Departmental Committee on the Royal College of Science, etc. 4000 w. Engng—Feb. 9, 1906. No. 75076 A.

The Dresden Technical High School. Begins an illustrated detailed description of the new mechanical department and its equipment. 1800 w. Engr, Lond—Jan. 26, 1906. Serial. 1st part. No. 74890 A.

The Technical Training of Apprentices. Prof. Sir W. Ripper. Discusses the standing of technical education in England, and the attitude of employers. 2200 w. Engr, Lond—Feb. 9, 1906. No. 75070 A.

The Education of the Commercial Engineer. W. Bardill. Read before the Birmingham Assn. of Mech. Engrs. General remarks on education, with discussion of this special subject as viewed from the English standpoint. 4200 w. Engr, Lond—March 16, 1906. No. 75804 A.

The College Shop. Dexter S. Kimball. Briefly explains the aim in manual training schools, trade schools, and engineering colleges, discussing the college shop in detail. Ills. 3800 w. Am Mach—Vol. 29, No. 16. No. 76125.

The Education of Mining and Metallurgical Engineers. Prof. John Bonsall Porter. Read before the Can. Min. Inst. Outlines the course of study which will give the best preparation possible. Many illustrations accompany this article. 3800 w. Can Min Rev—April, 1906. No. 76181 B.

The Successful Apprenticeship and Educational System of the General Electric Co., West Lynn, Mass. An address by M. W. Alexander, who developed the system, describing its features. 4200 w. Mach, N Y—April, 1906. No. 75879 C.

The Teaching of Metallurgy in College Laboratories, and a Description of the Equipment and Uses of the Metallurgical Laboratories at McGill. Dr. A. Stansfield. Considers the use and limitations of such teaching, and describes the equipment at McGill University. Ills. 4000 w. Can Min Rev—April, 1906. No. 76182 B.

Education and Training of Engineers. The essential part of the report of the Committee on the Education of Engineers, appointed by the Institution of Civil Engineers. Also editorial. 4500 w. Engr, Lond—April 27, 1906. No. 76579 A.

The Education and Training of Engineers—Civil and Naval. W. H. White. Discusses the report by the Committee of British engineering societies

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### Education

appointed to consider the best method of training all classes of engineers. 9500 w. Nineteenth Century—June, 1906. No. 77298 D.

Technical Education in Relation to Industrial Development. Charles G. Washburn. A review of the history of industrial development and industrial education in the United States. A Commencement address. 10000 w. Jour Worcester Poly Inst—July, 1906. No. 78003 C.

The Armstrong College, Newcastle-on-Tyne. Illustrated detailed description of the new extensions and the uses to which they are to be applied. 3000 w. Engr, Lond—July 6, 1906. No. 77990 A.

The Education of Mining Engineers. J. W. Gregory. Abstract of a paper read before the Inst. of Min. Engrs. Especially considers the needs of Great Britain, discussing the requirements. 3500 w. Ir & Coal Trds Rev—June 22, 1906. No. 77790 A.

The Relation Between Technical Education and Industrial Progress. Robert H. Richards. States facts relating to the development in the United States, and explains obstacles encountered. 6000 w. Tech Qr—June, 1906. No. 78005 E.

Engineering Education. An informal discussion at the annual convention, June 27, 1906, on the subjects of the best preparatory education for the civil engineering profession, and whether technical training is the best education for executive work. 9000 w. Pro Am Soc of Civ Engrs—Aug., 1906. No. 78874 E.

The Intellectual Value of Tool Work. W. T. Harris. Read before the Nat. Ed. Assn., Nashville, Tenn. Discusses men as tool workers, and the education that is most helpful to advancement in the industrial field. 3500 w. Sci Am Sup—Aug. 18, 1906. No. 78626.

A Comparison of University and Industrial Discipline and Methods. Frederick W. Taylor. From an address delivered at the dedication of the Engineering Building for the University of Pennsylvania. Discussed from the point of view of the employer, having in mind the preparation for success in commercial engineering and industrial enterprises. 2300 w. Eng News—Oct. 25, 1906. No. 80092.

A Great Educational Plant Dedicated. An account of the dedication of the new engineering building of the University of Pennsylvania and its equipment for instruction in mechanical, electrical, and civil engineering. Ills. 2500 w. Ir Trd Rev—Oct. 25, 1906. No. 80103.

A Model College Engineering Building.

### Engineering Trade

Illustrated description of the new building for the civil and mechanical engineering departments at the University of Pennsylvania. 5000 w. Ir Age—Oct. 25, 1906. No. 80084.

Engineering Education. An informal discussion at the annual convention, June 27, 1906. 6000 w. Pro Am Soc of Civ Engrs—Sept., 1906. No. 79536 E.

Instruction in Mathematics and Physics in Higher Schools (Bericht über Mathematischen und Naturwissenschaftlichen Unterricht an Unsern Höhern Schulen). A. Gutzmer. A report discussing especially projects for educational reform in the matter of instruction in science in the German Schools. 6000 w. Zeitschr d Ver Deutscher Ing—Oct. 6, 1906. No. 79907 D.

The Engineer as a Citizen. Address by Prof. Alexander C. Humphreys at the dedication of the new engineering building of the University of Pennsylvania. Discusses the instruction needed by engineering students to fit them for the usefulness awaiting them. Also editorial. 5000 w. Eng Rec—Oct. 27, 1906. No. 80111.

The Technical School and the University. Prof. W. H. Burr. An address on the importance of practical scientific training. 1800 w. Am Mach—Vol. 29. No. 43. No. 80080.

### Egypt.

The Development of Egypt in 1906. J. Stephen Jeans. Consumption of iron and steel and the conditions of supply are discussed. Ills. 15700 w. Ir & Coal Trds Rev—July 27, 1906. No. 78484 A.

Egypt in 1905. Reviews such portions of Lord Cromer's annual report as are of interest to engineers. 4000 w. Engr, Lond—June 22, 1906. No. 77798 A.

Seven Years in the Soudan. Information from Lord Cromer's last report concerning the work accomplished during the last seven years. 2000 w. Engr, Lond—July 13, 1906. No. 78223 A.

### Electricity.

Application of Electricity in the Development of American Industries and Manufacturing. Charles F. Scott. Remarks on power as the fundamental element in manufacturing operations, and the new methods made possible by electric power. 2500 w. Ind Wld—June 28, 1906. No. 77751.

### Engineering Trade.

Industrial Depressions and Engineering Export and Import Trade. W. Pollard Digby. A critical statistical analysis of the sources of national prosperity and their

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### Experiment Station

relation to commercial fluctuations. 3500 w. Engineering Magazine—Feb., 1906. No. 74674 B.

### Experiment Station.

The Engineering Experiment Station of the University of Illinois. An illustrated article giving a brief outline of the equipment of this station and the work it is purposed to carry on. 1200 w. Elec Rev, N Y—July 21, 1906. No. 78087.

### Export Duty.

The Economic Effect of the Export Duty on Coal. Emerson Bainbridge. Aims to prove that the imposition of this tax in England has been and is a serious economic error. 3000 w. Col Guard—Jan. 5, 1906. No. 74413 A.

### Exposition.

Mechanical and Technical Notes on the Liège Exposition (Maschen-technische Reisenotizen von der Lütticher Weltausstellung). Julius Divis. A general descriptive account of the mechanical exhibits, with professional comments. Serial. Part I. 2000 w. Oesterr Zeitschr f Berg u Hüttenwesen—Oct. 21, 1905. No. 73344 D.

Electricity at the Liège Exposition (L'Electricité à l'Exposition de Liège). A series of illustrated reviews by various specialists of the various electrical exhibits at the Liège exposition. Serial, Part I. 4000 w. L'Electricien—Jan. 6, 1906. No. 75765 B.

The Milan International Exposition (Die Internationale Ausstellung in Mailand). With plan of the grounds, and a general account of the arrangement of the Exposition. 1500 w. Stahl u Eisen—June 1, 1906. No. 77632 D.

The Milan International Exposition (L'Exposition Internationale de Milan). E. Lemaire. A well illustrated description of the buildings and grounds of the Milan exposition, celebrating the successful completion of the Simplon tunnel. 3500 w. Génie Civil—June 9, 1906. No. 78120 D.

Milan International Exhibition. J. William Chubb. Begins a descriptive account of the interesting exhibits and gives information concerning Italian engineering work. 2500 w. Am Mach—Vol. 29. No. 33. Serial. 1st part. No. 78580.

### Finances.

The Finances of Engineering. William D. Marks. A discussion of the salaries paid engineers, and the business methods affecting them. 4500 w. Jour Fr Inst—March, 1906. No. 75559 D.

### Fire Losses.

Fire Losses in the United States. A

### Industry

Grave National Question. Joseph K. Freitag. A discussion of the lessons of the San Francisco disaster, showing the general lack of real fire-proof construction throughout the country. 3500 w. Engineering Magazine—June, 1906. No. 76871 B.

### Geology.

Geology in Relation to Engineering. Stanley C. Bailey. An illustrated article showing the value of a good knowledge of geology to civil and mining engineers and architects; and calling attention to various cases where the knowledge is of use. 3000 w. Engr, Lond—March 16, 1906. Serial, 1st part. No. 75800 A.

### Germany.

The American and the German Peril. Louis J. Magee. A comparison of American and German industrial methods, with especial emphasis upon the value of the interchange of experiences. 4000 w. Engineering Magazine—Jan., 1906. No. 73890 B.

The American and the German Peril. Louis J. Magee. Mr. Magee's second article deals principally with the present German industrial policy and its ideals. 4000 w. Engineering Magazine—Feb., 1906. No. 74670 B.

The American and the German Peril. Louis J. Magee. The third and concluding article treats of American trade methods as tested by German experience. 2500 w. Engineering Magazine—March, 1906. No. 75162 B.

### Government Work.

An Army View of American Government Engineering. Maj. W. L. Sibert. An advocacy of government control of engineering work and of its practical efficiency. 2500 w. Engineering Magazine—June, 1906. No. 76874 B.

### Industrial Relations.

The Railroads and Mining. Dr. James Douglas. From an oration before the graduating class at Columbia University. Considers some of the relations of railroad transportation in the United States to mining and metallurgy. 2000 w. Ir Age—Oct. 18, 1906. No. 79823.

### Industrial Training.

An Experiment in Industrial Training. Magnus W. Alexander. An illustrated article explaining the apprenticeship system of the General Electric Co., at West Lynn, Mass. 4000 w. Mach, N Y—Sept., 1906. No. 78962 C.

### Industry.

The Importance of Industrial Studies for the Work of the Engineer (Die Be-

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### Inspection

deutung Wirtschaftlicher Studien für den Stand der Ingenieure). H. Kollman. A review of the relation of engineering work to the economic and industrial development of a nation. 4000 w. Zeitschr d Ver Deutscher Ingenieure—Jan. 20, 1906. No. 75104 D.

### Inspaction.

The Position of the Constructing Engineer, and His Duties in Relation to Inspection and the Enforcement of Contracts. Albert J. Himes. 7000 w. Pro Am Soc of Civ Engrs—Nov., 1905. No. 73438 E.

### Invention.

American Inventors in the German Patent Office. 1 official statement from Pres. Hauss, of the Imperial Patent Office, dealing with the treatment of American inventors as patentees in Germany. 1500 w. Elec Wld & Engr—Nov. 11, 1905. No. 73201.

The Real Want and Commercial Value of Potential Inventions. F. C. Fraentzel. Statements bearing on inventions as an investment and the real want and commercial value of patented inventions to both the inventor and investor, based on an experience of twenty years in obtaining letters-patent. 2500 w. Stevens Ind—Oct., 1905. No. 73927 D.

Some Principles of Sound Engineering for the Inventor. Thorburn Reid. Supplemental to an earlier article on "Exploiting an invention." Shows that successful inventions must be guided by good engineering and business sense. 4000 w. Cassier's Mag—Oct., 1906. No. 79526 B.

### Inventory.

Plant Inventory—Importance. Value and Method of Keeping a Going Inventory. F. B. Johnson. Gives forms of card records and shows its usefulness and value. 1200 w. Am Mach—Vol. 29. No. 21. No. 76771.

### Iron Industry.

The German Iron Industry in Competition for the Markets of the World (Die Deutsche Eisenindustrie und ihren Kampf um den Weltmarkt). Dr. Alexander Tille. A review of the influence of protection and free trade upon the export iron business of Germany. 5000 w. Zeitschr d Ver Deutscher Ing—Oct. 21, 1905. No. 73303 D.

The Iron and Steel Industry. A review of the production, comparing the principal iron producing countries. 3000 w. Engng—Nov. 10, 1905. No. 73290 A.

A Review of Conditions in the American Iron Industry. Edwin C. Eckel. A critical review of the statistics of iron

### Labor

manufacture in the United States during 1903, 1904, and 1905, with tables and diagrams. 3500 w. Engineering Magazine—Jan., 1906. No. 73892 B.

The Iron and Steel Industries of the United States (L'Industrie Siderurgique aux Etats Unis). G. Rivière. A statistical and descriptive review of the industry in America, with illustrations and plans of the principal plants. 18000 w. 3 plates. Mem Soc Ing Civ de France—Feb., 1906. No. 76237 G.

### Iron Ore.

The Lake Superior Iron Ore Trade in 1905. Dwight E. Woodbridge. A report of the most prosperous year yet recorded, the production exceeding the previous year by more than 6,000,000 tons. 4000 w. Ir Age—Dec. 28, 1905. No. 74024.

Estimated Fifty Million Tons Iron Ore This Year. Editorial review of the ore shipments through the Sault canals since 1855, showing the increase, and commenting on the future outlook. 900 w. Min Wld—March 24, 1906. No. 75674.

### Iron Trade.

The Chicago Iron Trade in 1905. A. O. Backert. Reports the projected increase in producing capacity, an unequaled buying movement, new construction materials, finished product, &c. 5000 w. Ir Age—Jan. 4, 1906. No. 74224.

The Pittsburg Iron Trade in 1905. Robert A. Walker. A review of the year, reporting new construction, price agreements, labor matters, materials, coke, and finished iron and steel. 6400 w. Ir Age—Jan. 4, 1906. No. 74223.

The Philadelphia Iron Trade in 1905. Thomas Hobson. Gives a cheerful forecast for 1906, considering prices, materials, &c. 4000 w. Ir Age—Jan. 4, 1906. No. 74225.

### Italy.

Italian Industries. On the rapid commercial development of Italy, and the causes. The present article discusses the utilization of the abundance of water. Ills. 3500 w. Engr, Lond—April 20, 1906. Serial. 1st part. No. 76449 A.

### Japan.

The Economic Future of Japan. Achille Viallate. Discusses the efforts being made to transform the economic system of the country, and the outlook as affecting other nations. 5000 w. Jour Fr Inst—June, 1906. No. 77323 D.

### Labor.

Obstructionism, or a New Form of Strike on the Italian Railways. Explains this form of strike, relating the causes

# INDUSTRIAL ECONOMY

## Labor

that led to it, describing how it became developed, the results, and measures taken against it. 3500 w. *Bul Int Ry Cong*—Oct., 1905. No. 73405 F.

The Incorporation of Labor Unions. Howard R. Bayne. Discusses the incorporation and does not consider that it should be made compulsory. 1500 w. *R R Gaz*—Vol. XXXIX., No. 20. No. 73228.

The Realization of Ideals in Industrial Engineering. H. F. J. Porter. A discussion of the effect of the human element upon the efficiency and working organizations in office and shop. 5500 w. *Trans Am Soc of Mech Engrs* (No. 082)—Dec., 1905. No. 73440.

The Fight for the Open Shop. Isaac F. Marcosson. An account of the victory of organized employers over labor unions, and the protection of non-union men. Ills. 5000 w. *World's Work*—Dec., 1905. No. 73736 C.

Better Methods of Compensation for Workmen. George W. Dickie. Discusses present systems and their disadvantages, and outlines a system of contracting for the labor as a whole with the workmen, urging its advantages. 6000 w. *Cassier's Mag*—Jan., 1906. No. 74460 B.

Dr. Wm. Jacks on Labor Problems and Legislation. Interesting remarks on the problems of trade disputes and industrial cooperation. 2300 w. *Ir & Coal Trds Rev*—Jan. 19, 1906. No. 74760 A.

Method of Exporting Chinese Coolies to the Transvaal. An explanation of the system established by the Chinese Government, for the enlistment of coolies for work in the mines of the Transvaal. 2200 w. *Min & Sci Pr*—Jan. 27, 1906. No. 74846.

The Unemployed and Trades Unions. David McLaren Morrison. Claims that the number of the unemployed is due to the mistaken policy of the trades unions, and outlines a plan to provide age pensions and for sickness, and suggests following the example of Germany in confining those who will not work and forcing them to earn. 2000 w. *Nineteenth Cent*—March, 1906. No. 75659 D.

The Condition of the German Working-man. Earl Dean Howard. Abstract of a chapter of the author's essay upon "The Cause and Extent of the Recent Industrial Progress of Germany." An interesting discussion of the factors other than wages which affect the condition. 6500 w. *Ir & Coal Trds Rev*—April 6, 1906. No. 76085 A.

Railway Servants Hours of Labor. Discusses the question as related to Eng-

## Mechanics

land. 2300 w. *Engr, Lond*—May 11, 1906. No. 76767 A.

The Insurance of Labor in France. Editorial on the action taken to make employers responsible for labor in case of accident or sickness, the State being responsible, should the owner fail. 3000 w. *Engng*—May 25, 1906. No. 77142 A.

Chinese Labor in the Light of Modern Industry. Barrett Smith. A record of practical experience with coolie labor, expressing an optimistic opinion as regards the availability of Chinese labor for great engineering undertakings. 3500 w. *Engineering Magazine*—August, 1906. No. 78198 B.

Philippine Labor. L. E. Bennett. Gives information concerning native labor in various parts of the islands, and the traits of character; their adaptability and skill in the use of mechanical appliances, etc. Ills. 3500 w. *R R Gaz*—Sept. 7, 1906. No. 79101.

The Democracization of Industry, or Enlightened Methods of Treating the Employed. H. F. J. Porter. Discusses the progress and improvements recently introduced for the betterment of employees, and their comfort, and the results. Ills. 3000 w. *Jour Fr Inst*—Sept., 1906. No. 79261 D.

The Labor Problem in Great Britain. T. Good. Gives a proposed solution after explaining present conditions. 3000 w. *Cassier's Mag*—Sept., 1906. No. 79252 B.

The United States Eight-Hour Law; Its Constitutionality and Construction. William B. King. A discussion of the provisions of this law. 4000 w. *Eng Rec*—Sept. 8, 1906. Serial. 1st part. No. 79038.

## Laboratory Appliances.

Labor-Saving Appliances in the Laboratory. Edward Keller. Describes and illustrates a number of improved methods and apparatus introduced in the newly equipped assay laboratory of the Anaconda Copper Mining Co. in Baltimore. 2800 w. *Jour Fr Inst*—Feb, 1906. No. 75092 D.

## Manufacturing.

The Engineer in Manufacturing Industries. Walter S. Graffam. Explains what is meant by manufacturing industries, and the position which the engineer holds in relation to manufacturing. 3000 w. *Elec Rev, N Y*—Dec. 9, 1905. No. 73641.

## Mechanics.

The Development of Mechanics. S. E. Slocum. Outlines three stages of development, sketching the chief character-



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## Metric System

istics of each. 1800 w. Pop Sci M—Sept., 1906. No. 78869 C.

## Metric System.

The Metric System Fallacy. W. M. McFarland. Abstract of testimony on this subject, given before the American Congressional Committee on Coinage, Weights and Measures. 3500 w. Cassier's Mag—Feb., 1906. No. 74919 B.

## Mining.

Mining Stocks—How to Calculate Their Values. Francis C. Nichols. Gives statements, calculations, and tables aiming to bring together material which may be a guide to the proper understanding of the risks and opportunities in mining ventures. 3500 w. Min Wld—March 17, 1906. Serial, 1st part. No. 75579.

## Mining Industry.

The Relation of the Federal Government to the Mining Industry. C. N. Hays. Read at the El Paso meeting of the Am. Min. Cong. Endeavors to show what the federal government is now doing for this industry, and the directions in which it may safely expand its activities. 5000 w. Min Rept—Nov. 30, 1905. No. 73508.

I. Copper. Frederick Hobart. II. Copper in Arizona in 1905. James Douglas. III. The Lake Superior Copper District. C. E. Thomas. The papers reviewing the history of copper for the year, the production prices, &c. 6800 w. Eng & Min Jour—Jan. 6, 1906. No. 74253.

I. Gold and Silver. Frederick Hobart. II. Commercial Movement of Gold and Silver in 1905. A. Selwyn-Brown. Yearly reports of production and demand. 2500 w. Eng & Min Jour—Jan. 6, 1906. No. 74252.

Iron and Steel. Reports concerning this industry from Frederick Hobart. L. W. Friedman, E. Morrison, George H. Cushing, E. F. Luty and Dwight E. Woodbridge, covering the various districts. 1400 w. Eng & Min Jour—Jan. 6, 1906. No. 74271.

I. Lead. W. R. Ingalls. II. The Coeur D'Alene in 1905. Stanley A. Easton. III. The Southeast Missouri Lead District. H. A. Wheeler. A review of the year. 4500 w. Eng & Min Jour—Jan 6, 1906. No. 74254.

Ore Deposits and Industrial Supremacy. John L. Steward. Considers the influence of economic geology on the industrial stability of the country. 2800 w. Ec Geol—Dec., 1905. No. 74707 D.

I. Zinc. W. R. Ingalls. II. The Jop-

## Patents

lin District. Jesse A. Zook. III. Virginia Lead and Zinc Mining in 1905. J. A. Van Mater. IV. Zinc Mining in Wisconsin in 1905. E. W. Moore. A yearly review of the zinc industry in the various districts. 6400 w. Eng & Min Jour—Jan. 6, 1906. No. 74255.

## Municipal Ownership.

The Dalrymple Report. The full report of Mr. Dalrymple, of Glasgow, on the Chicago street railway situation. 8400 w. St Ry Jour—March 17, 1906. No. 75578 C.

The Agitation for Municipal Ownership in the United States—Its Origin, Meaning, and Proper Treatment. Everett W. Burdett. Abstract of an address before the Nat. Elec. Lgt. Assn. Shows that public ownership has not produced the results desired, and suggests public control as better. 3500 w. Elec Rev, N. Y.—June 23, 1906. No. 77444.

Municipal Ownership in Germany. Hugo R. Meyer. Discusses the record of municipal failure in public service industries and the effect, especially in the development of electric railways. 2200 w. Elec Ry Rev—July, 1906. No. 77963.

Municipal Ownership: Three Important Changes in the Public Point of View. Charles Whiting Baker. Editorial presenting the substance of an address at Ithaca, N. Y., opening a discussion on the subject of municipal ownerships. 2000 w. Eng News—July 5, 1906. No. 77822.

## Museums.

The Practical Value of Industrial Museums. Alfred Sang. A discussion of the value of the industrial museum as a force in educating and directing invention and productive energy. 3500 w. Engineering Magazine—Oct., 1906. No. 79381 B.

## Patents.

The Patent Law Situation. Ludwig Gutmann. A discussion on the present status of patents, with editorial comment. 3500 w. Elec Wld & Engr—Nov. 18, 1905. No. 73246.

Some Phases of Our Patent System. W. R. Wood. Explains some points in the application for patents, and the reasons for them. 2200 w. Am Mach—Vol. 28, No. 49. No. 73648.

Patents in Their Relation to the Gas Engine and the Automobile. S. M. Howell. The writer has given much time to the study of the priority of patents of this class, and aims to give some helpful information on this subject. Ills. 2200 w. Mach. N Y—Jan., 1906. Serial. 1st part. No. 74115 C.

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### Philippine Islands

Patent Methods and Industry (Patentwesen und Industrie). Franz Zeis. Showing the relations of an efficient patent law to the development of technical industries with a comparison of the German and Austrian systems. 3000 w. Zeitschr d Oesterr Ing u Arch Ver—June 8, 1906. No. 77618 D.

Patents as a Factor in a Manufacturing Business. Edwin T. Prindle. The first of a series dealing with the influence of patents in the control of business success, and the modern methods of developing industries based on patents. Serial. Part 1. 3500 w. Engineering Magazine—Sept., 1906. No. 78771 B.

Patents as a Factor in a Manufacturing Business. Edwin J. Prindle. The second paper discusses the nature of the protection which a patent affords to its owner, with examples of various cases. 5000 w. Engineering Magazine—Oct., 1906. No. 79387 B.

Patents as a Factor in a Manufacturing Business. Edwin J. Prindle. The third paper discusses the patent knowledge necessary before the manufacturer should issue the new product. 3500 w. Engineering Magazine—Nov., 1906. No. 79991 B.

Two Interesting Old Patents. Describes two patents issued in 1788 by King George the Third, of England, dealing with the application of the steam engine to the propulsion of vessels and of vehicles. Ills. 1800 w. Power—Sept., 1906. No. 78879 C.

### Philippine Islands.

Labor Conditions in the Philippine Islands. J. W. Beardsley. Shows briefly some of the essential conditions surrounding the labor problem in the Philippines. 9500 w. Eng News—Nov. 23, 1905. No. 73421.

Sanitary Conditions as Affecting Contracts for Works, in the Philippine Islands. Maj. E. C. Carter. An authoritative report of present conditions. 2000 w. Eng News—Nov. 23, 1905. No. 73422.

Transportation Systems and Projects in the Philippines. L. W. Bennett. A handsomely illustrated account of the resources, needs, and special industrial, agricultural and commercial features of the islands. 3500 w. Engineering Magazine—May, 1906. No. 76273 B.

### Piece Work.

Piece Work. J. Bertram. Explains a piece-work plan in which the price is fixed per piece. 1200 w. Am Mach—Vol. 29. No. 18. No. 76470.

### Public Utilities

A Rational Method for the Introduction and Management of Piece-Work in Railroad Shops. William S. Cozad. Read before the New England R. R. Club. Describes the organization worked out for the Erie R. R. on the piece-work system. 2400 w. R R Gaz—April 13, 1906. No. 76048.

### Pig Iron.

The Southern Pig Iron Market in 1905. James A. Green. A review of the year by months. 4500 w. Ir Age—Jan. 11, 1906. No. 74303.

### Population.

Urban Tendencies of Population as Affecting the Problems of Engineers. Erastus G. Smith. Gives statements showing the tendency toward life in cities, and discusses the causes and effects of concentration of population upon engineering problems. General discussion. 10500 w. Jour W Soc of Engrs—June, 1906. No. 77505 D.

### Production.

Concentration in Manufactures. Editorial discussion of the effect of such systems upon economy of production. 2000 w. Engng—Feb. 16, 1906. No. 75288 A.

### Profit Sharing.

Profit Sharing as a Peace and Profit Maker. R. M. Downey. Read at meeting of the Nat. Metal Trds. Assn. Explains the plan adopted by the Keystone Driller Company, which is working to the satisfaction of all concerned. 2500 w. Ir Age—March 29, 1906. No. 75824.

Shop Betterment and the Individual Effort Method of Profit-Sharing. Harrington Emerson. Discusses the shop problem of the present, and explains a system of profit-sharing believed to include all that is best in other methods, and to exclude much that is objectionable. 4000 w. Am Engr & R R Jour—Feb., 1906. No. 74853 C.

### Public Ownership.

The Ownership of Public Utilities. Lyman E. Cooley. Briefly discusses the problem in its historical and geographical aspect, giving the writer's conclusions. 3000 w. Jour W Soc of Engrs—Feb., 1906. No. 75417 D.

### Public Utilities.

A Bill Providing for Government Development and Ownership of Water Power in Ontario. A discussion of a bill representing one of the most extensive experiments in public ownership of utilities ever tried. 1000 w. Eng News—May 24, 1906. No. 76777.

# INDUSTRIAL ECONOMY

## Railways

### Railways.

The Railways of the World (Die Eisenbahnen der Erde). Condensed statistics of the development of the railways of the earth from 1900 to 1904, with map. 2000 w. Stahl u Eisen—June 1, 1906. No. 77633 D.

### Rate Regulation.

President Stickney on Rate Regulation. Extract from a paper in the *Political Science Quarterly*, for March, 1906. Advises an interstate commerce investigation committee outlining the work it should undertake, before legislation is framed. 2500 w. R R Gaz—April 6, 1906. No. 75955.

The Hepburn Bill. Editorial discussion of this bill for rate regulation, pointing out the good and bad features. 2000 w. R R Gaz—April 27, 1906. No. 76377.

### Reichsanstalt.

The Work of the Reichsanstalt in 1905. Editorial review of the report for this year. 5000 w. Engng—Aug. 31, 1906. No. 79142 A.

### Selling.

How Machine Tools Are Sold. A conversation between Mr. H. F. Frevert, who has had many years' experience of trade conditions on both sides of the Atlantic, and the publisher. 4400 w. Mach, N Y—Jan., 1906. No. 74116 C.

### Shipping.

See Marine and Naval Engineering.

### Shop Hygiene.

Recent Improvements in the Hygiene of Workshops (Les Améliorations Récentes dans l'Hygiène des Ateliers). Paul Razous. Discussing especially appliances for the removal of dust, gases, and injurious vapors from workrooms. Two articles. 5000 w. Génie Civil—Jan. 6, 13, 1906. No. 74633 each D.

### Specialization.

Specialization in Manufacturing. Alexander E. Outerbridge, Jr. Discusses the results of specialization as illustrated by America's remarkable growth. 3000 w. Cassier's Mag—Oct., 1906. No. 79528 B.

### Specifications.

A Legal Criticism of Government Specifications. Suggestions based on conversations with contractors and a study of the decisions of the Supreme Court and Court of Claims, and experience in cases in those courts. 2000 w. Eng Rec—March 3, 1906. No. 75387.

### Standardization.

Standardization in British Engineer-

## Tin Plate

ing Practice. Sir John Wolfe Barry. Read before the British Assn. Remarks on the work of Sir Joseph Whitworth, introductory to an explanation of the work of the Engineering Standards Committee and a statement of the advantages. 4500 w. Engng—Aug. 10, 1906. No. 78677 A.

### Steel Corporation.

The United States Steel Corporation's Annual Report. Extracts from the report covering the operations of the fiscal year ended Dec. 31, 1905, showing the largest gross earnings in its history. 4000 w. Ir Age—March 22, 1906. No. 75633.

### Steel Industry.

The Birth and Growth of the Steel Industry in America. James N. Hatch. Historical review of the development of the steel industry. 3500 w. Jour W Soc of Engrs—Aug., 1906. No. 78890 D.

The Growth of the Steel Industry. Harold Baxter. Discusses the cause of the present activity in the steel market, and the probability of finding iron ore in Colorado. 1800 w. Min Rept—July 19, 1906. No. 78091.

### Systematizing.

The Need for Systematic Methods in the Conduct of Engineering Works. W. O. Horsnail. Shows the need of systematic methods. 1000 w. Elec Rev, Lond—June 8, 1906. No. 77382 A.

Typical Factory Systems and Their Practical Results. Egbert P. Watson. A comparison of the older establishments, purely commercial or mechanical in administration, with those including modern welfare methods. 3500 w. Engineering Magazine—July, 1906. No. 77685 B.

### Tabulating.

Tabulating - Machine Cost - Accounting for Factories of Diversified Product. Morrell W. Gaines. An examination of mechanical methods of analysing and tabulating records. 4000 w. Engineering Magazine—Dec., 1905. No. 73375 B.

### Tees-side.

Tees-side as an Industrial Center. A report of the project of developing districts outside of the large cities, for manufacturing purposes, presenting the considerations advanced to influence the choice of Tees-side for industrial works. 3000 w. Engng—July 6, 1906. Serial. 1st part. No. 77979 A.

### Tin Plate.

The Sheet and Tin Plate Trade. B. E. Luty. A review of the phenomenal increase in production, comparing with the previous year, and discussing prices, la-

# INDUSTRIAL ECONOMY

## Transportation

bor, competition, &c. 3500 w. Ir Age—Jan. 11, 1906. No. 74302.

## Transportation.

Transportation, and Its Relation to Manufacture. Jno. J. Baulch. Shows their dependence upon each other, and considers especially conditions at St. Louis. Discussion. 11600 w. Pro St Louis Ry Club—April 13, 1906. No. 76692.

## Transportation Costs.

The Cost of Transportation of the Raw Materials in the Iron Industry (Die Rohstoff-Gütertarife der Eisenindustrie). E. Schrödter. A comparative review of the cost of railway transport of iron ore in the principal manufacturing countries, showing the importance of a reduction in rates in Germany. 10000 w. Stahl u Eisen—Dec. 15, 1905. No. 74642 D.

## Valuation.

The Valuation of Machinery for Rating Purposes. Frederick Marshall. Abstract of a paper read before the Surveyor's Inst. Discusses British law on the rating of machinery, citing several cases. 3000 w. Ir & Coal Trds Rev—Feb. 16, 1906. No. 75293 A.

## Wages.

Wages in the Engineering and Shipbuilding Industry in the 19th Century. A. L. Bowley and G. H. Wood. Abstracted from a paper read before the Statistical Society. Gives diagrams showing fluctuations of wages, and information of interest. Steady progress is shown. 3800 w. Ir & Coal Trds Rev—March 9, 1906. No. 75594 A.

## Water Transportation.

Water Transportation; Its Economic Importance. Frank Haigh Dixon. Discusses the economic importance of water transportation in the United States at the present time, under the heads of ocean, lake, river, and canal transportation. 10500 w. St Louis Ry Club—Nov. 10, 1905. No. 73758.

## Workmen's Houses.

General and Special Considerations upon the Design and Construction of Workmen's Dwellings (Allgemeines und Spezielles über den Bau und die Einrichtung von Arbeiterwohnungen). Dr. Henrici. A review of existing practice, showing the importance of combining convenience and comfort, with correct sanitation, with moderate cost. 3500 w. Zeitschr de Ver Deutscher Ing—June 16, 1906. No. 78102 D.

## Works Management.

The Square Deal in Works Management. O. M. Becker. Mr. Becker's sec-

## Zinc

ond paper discusses the methods which may be employed in the betterment of the plant itself, with numerous illustrations. 5000 w. Engineering Magazine—Feb., 1906. No. 74672 B.

The Square Deal in Works Management. O. M. Becker. The third article discusses the attempts which have been made to better the physical condition of workers, by providing lunch rooms, seats, proper sanitary conveniences, etc., in many large establishments. 6000 w. Engineering Magazine—March, 1906. No. 75163 B.

The Square Deal in Works Management. O. M. Becker. The first installment of a serial; the present portion discussing the common-sense of the management of men. 3500 w. Engineering Magazine—Jan., 1906. No. 73894 B.

The Square Deal in Works Management. O. M. Becker. Mr. Becker's fourth and concluding paper deals with the auxiliary methods of successful labor employers in developing the interest and welfare of their employees. 4000 w. Engineering Magazine—April, 1906. No. 75786 B.

A History of the Introduction of a System of Shop Management. James M. Dodge. An account of the introduction of the Taylor system, and the results. Discussion. 3500 w. Am Soc of Mech Engrs, No. 094—May, 1906. No. 76111.

The Commercial Organization of Engineering Factories. Henry Spencer. The first of a series of articles describing the whole commercial routine of an engineering factory, especially the principles of organization. 3000 w. Engr, Lond—March 30, 1906. Serial. 1st part. No. 76015 A.

Systems for Simplifying Shop Supervision. Albert W. Thompson. A description of the system in use in the repair shop of the Amoskeag Mfg. Co., with reproductions of forms and records. 3000 w. Engineering Magazine—Sept., 1906. No. 78774 B.

Some Features of Works Management and Equipment. Thomas B. O'Neill. An illustrated article explaining features of the Philadelphia plant of the Link Belt Co. 1200 w. Mach, N. Y.—Oct., 1906. No. 79611 C.

## Zinc.

The Zinc Industry in Silesia in 1905. Paul Speier. Reviews the business of the year, and calls attention to the change in zinc smelting practice gradually taking place, from the old type of furnace to the Rhenish type. Also editorial. 2000 w. Eng & Min Jour—Jan. 27, 1906. No. 74730.

# MARINE AND NAVAL ENGINEERING

## American Navy

### American Navy.

American Naval Organization and the Personnel Law of 1899. George W. Melville. Discusses the working of this system, replying to points in a paper by Admiral S. B. Luce, in the *North American Review*. 3000 w. Cassier's Mag—July, 1906. No. 78000 B.

### Armor.

Armor and Its Attack. N. E. Edwards. Read before the British Assn. Reviews the history of armor protection for ships and its development, manufacture, etc. Ills. 4500 w. Engr, Lond—Sept. 7, 1906. No. 79242 A.

Armor and Ships. Prepared for use in the Department of Artillery, U. S. Artillery School. Considers armor and methods of securing it to the ship, penetration of projectiles, structural arrangement of ships, etc., etc. Ills. 28500 w. Jour U S Art—July, 1906. No. 79487 D.

### Assistant Cylinders.

Performance of the Assistant Cylinders of the Washington. W. W. Smith. Gives the performance of the assistant cylinders, comparing the performance of assistant and balance cylinders, installed on similar engines and working under the same conditions, and describes a practical method of analyzing the indicator cards and working out the results. 6500 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79485 H.

### Barges.

Steel Barges. Richard J. Donovan. Gives statements concerning river transportation, the character of the business and methods of handling, the types of carriers, &c., illustrating and describing the typical river steamboat and steel barge. Discussion. 4000 w. Pro Engrs' Soc of W Penn—Jan., 1906. No. 74542 D.

### Battleships.

A Comparison of Recent Battleships. H. G. Gillmor. A comparison from the point of view of the designer and builder of the latest battleships of Gt. Britain, France, United States, Germany, Italy, and Japan. 3000 w. (No. 6.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73188 C.

U. S. Battleship Virginia. C. A. Gardiner. Description of the vessel, armament, machinery, &c. 5500 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73954 H.

Contract Trials of the U. S. Battleship Virginia. Gives the dimensions, armament, and report of trials. 1500 w. Jour Am Soc of Nav Engrs—Feb., 1906. No. 76349 H.

## Battleships

The Japanese Battleship Kashima. Illustration, with description of the vessel and its armament, and report of trials. Built in England. 2300 w. Engng—April 13, 1906. No. 76303 A.

The U. S. Battleship Louisiana. Illustration, with description and report of trials. 16000 w. Jour Am Soc of Nav Engrs—Feb., 1906. No. 76350 H.

U. S. Battleship Rhode Island. Charles B. Edwards and Ralph L. Lovell. Illustration, with description and report of official trial. 4000 w. Jour Am Soc of Nav Engrs—Feb., 1906. 76344 H.

Contract Trial Performance of the United States Battleship Louisiana. A. F. Bowen and H. B. Gregory. Gives detailed description of the vessel, its armament, ordnance, equipment, etc., with report of trials. Also editorial. 7800 w. Int Marine Engng—May, 1906. No. 76421 C.

The Japanese Battleship "Katori." Fully illustrated article giving detailed description of the ship, its armor, armament, etc., with report of steam trials. 5700 w. Engng—May 11, 1906. No. 76762 A.

French Dreadnoughts. A discussion of the proposed French battleship-cruiser, giving plans. 1700 w. Engr, Lond—June 1, 1906. No. 77270 A.

New Battleship Designs. Gives in-board profile, deck plans, and description of a powerful Russian design, and also an American design submitted to the Navy Department, comparing the two, and giving data for the guns of various ships. 1200 w. Int Marine Engng—July, 1906. No. 77452 C.

The New Battleship New Jersey. Illustrated description, with report of trial. 800 w. Int Marine Engng—July, 1906. No. 77451 C.

H. M. Battleship "Agamemnon." Illustrates and describes this recently launched vessel. Also editorial discussion. 3000 w. Engng—June 22, 1906. Serial. 1st part. No. 77795 A.

Modern Warships. Sir William White. Cantor lecture delivered Jan. 29, 1906. Describes the characteristic features of modern warships; materials and methods of construction; armor protection and armament; improvements in propelling machinery, growth in dimensions and cost. 5000 w. Jour Soc of Arts—June 29, 1906. Serial. 1st part. No. 77873 A.

The New Japanese Battleships "Katori" and "Kishima." J. B. Van Brussel. Illustrated detailed descriptions of the vessels and their equipment. 1600 w. Sci Am—July 21, 1906. No. 78062.

## MARINE AND NAVAL ENGINEERING

### Bearings

H. M. Battleship Lord Nelson. Description of this vessel, with an account of its launching. 2000 w. Engr, Lond—Sept. 7, 1906. No. 79238 A.

U. S. Battleship Georgia. Clifton Lee, Jr. Illustrated description with report of trials. 6000 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79481 H.

U. S. Battleship New Jersey. Illustrated description with report of official trial. 3500 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79483 H.

A Further Argument for the Big Ships. Richard Wainwright. A reply to the arguments of Captain Mahan, and advocating big ships as typified by the English "Dreadnought." 2700 w. Pro U S Nav Inst—Sept., 1906. No. 7947 F.

H. M. S. "Dreadnought." Plates and editorial review of the principal features of this new battleship. 2800 w. Engng—Oct. 5, 1906. No. 79802 A.

The Battleships "Dreadnought" and "South Carolina." Illustrates these two types, based on lessons of the Japanese War, with descriptions of the important features. 2200 w. Sci Am—Oct. 27, 1906. No. 80094.

The French Battleship "Republique." Illustrated description of this new addition to the French navy. 800 w. Engr, Lond—Sept. 28, 1906. No. 79712 A.

Trials of H. M. S. "Dreadnought." A report of the very satisfactory trials of this English battleship. 1500 w. Engr, Lond—Oct. 12, 1906. No. 80060 A.

H. M. S. Dreadnought. Illustration, with a comparison with the Italian warship designed by Col. Cuniberti, and brief description. 900 w. Engr, Lond—Aug. 3, 1906. No. 78554 A.

Our Latest Battleships, "South Carolina" and "Michigan." Illustration, with a description of the leading features of their design. 1600 w. Sci Am—Aug. 14, 1906. No. 78424.

### Bearings.

An Investigation of the Pressures upon the Main Bearings and Crank Pins of Marine Engines. Edward M. Bragg. Reports an investigation undertaken with the object of finding an approximate method for the determination of the loads to which the crank-shaft bearings of a proposed engine would be subjected. Diagrams. 6500 w. Jour Am Soc of Nav Engrs—Feb., 1906. No. 76345 H.

### Bending Moments.

Longitudinal Bending Moments of Certain Lake Steamers. W. I. Babcock. Describes the very large ships recently put on the Lakes to meet new conditions, and

the lengthening of the "Victory." Investigates the changes in the longitudinal bending moments in a seaway in this ship, caused by this increase in length, and compares them with the largest ships now in lake service. 13 plates. 2800 w. (No. 9.) Soc Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73191 D.

### Boat Control.

A Submarine Torpedo Boat Controlled by Hertz Waves. M. Devaux. Abstract of a paper read before the Société Internationale des Electriciens. Describes the apparatus and the actions effected during trials. 800 w. Electn, Lond—Aug. 10, 1906. No. 78669 A.

### Boilers.

See Mechanical Engineering, Steam Engineering.

### Boiler Explosion.

See Mech. Engng., Steam Engineering.

### Breakdown.

A Marine Generating-Set Breakdown—Cause, Effect, and Repair. Illustrated description of a breakdown of an electric engine, discussing the cause. 1500 w. Am Mach—Vol. 29, No. 10. No. 75428.

### Bulkheads.

Notes on the Strength of Water-Tight Bulkheads for Battleships and Cruisers. Harold F. Norton. Explains the tests required by the Navy Department for battleships and cruisers, and gives curves, derived from formulæ, by use of which the required results may be immediately obtained. 2 plates. 3000 w. (No. 11.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73193 C.

### Bulkhead Doors.

Official Tests of Electrically Operated Bulkhead Doors. A report of the official trials made by the United States Navy Department. Ills. 1800 w. Marine Engng—April, 1906. No. 75859 C.

### Cable Steamer.

Twin-Screw Cable Steamer Grand Duke of Oldenburg (Doppelschrauben Kabeldampfer Grossherzog von Oldenburg). General description and details of cable-laying steamer built by Schichau for the North German Marine Cable Company. There are three cable tanks of 850 cubic metres capacity. 2000 w. 1 plate. Schiffbau—May 9, 1906. No. 76833 D.

See Electrical Engineering, Communication.

### Capstan.

New Electric Capstan at Antwerp. Illustrated description. 800 w. Sci Am—Dec. 30, 1905. No. 74060.

# MARINE AND NAVAL ENGINEERING

## Cargo Steamer

English and American Capstans and Electric Winches. Frank C. Perkins. Illustrates and describes types used. 1000 w. *Int Marine Engng*—May, 1906. No. 76423 C.

## Cargo Steamer.

Lake Cargo Steamer Hoover & Mason, Built With Hopper Type of Hold. Longitudinal and transverse sections with description of a departure in ore-carrier construction, explaining the improvements. 1200 w. *Naut Gaz*—June 7, 1906. No. 77189.

## Central Plant.

Mechanical Plant of the New 23d St. Ferry Terminals, New York. Describes the central power plant and heating system that will serve the new terminals of the Lackawanna, the Erie, and the Central Railroad of New Jersey. Ills. 3500 w. *Eng Rec*—Dec. 2, 1905. No. 73572.

## Coaling.

The Narragansett Bay Coal Depot. Augustus Smith. An illustrated detailed description of this important station with an interesting account of matters relating to it, its equipment, etc. 6400 w. *Pro Am Soc of Civ Engrs*—Aug., 1906. No. 78821 E.

The New Floating Coal Depot in Portsmouth Harbor. Frank C. Perkins. Illustrates and describes an interesting plant for the British Admiralty, for storing great quantities of coal afloat under the most favorable conditions. 1000 w. *Marine Engng*—Oct., 1906. No. 79468 C.

The Coaling of Ships at Sea (Le Ravitaillement en Mer des Navires). A Bidault des Chaumes. Describing especially the Temperley conveying apparatus, including the device by which the bucket is automatically locked to, and released from the carriage. 3000 w. *Génie Civil*—May 19, 1906. No. 78115 D.

Floating Depot for Coaling Warships. Day Allen Willey. Illustrates and describes the floating depot placed in service by the British Admiralty, and the methods used for loading and unloading. 800 w. *Sci Am*—Jan. 20, 1906. No. 74439.

The New Coaling Station at Narragansett Bay. Illustrated description of a new coaling station recently completed at Bradford, near Newport, and its operation. 3000 w. *Eng Rec*—Nov. 25, 1905. No. 73496.

## Cruisers

## Coast Lines.

Coastwise Steamship Lines of the United States. Illustrates and describes types of vessels belonging to the domestic marine and gives information relating to the service. Also information in regard to the domestic trade. 4000 w. *Naut Gaz*—Nov. 2, 1905. No. 73040.

## Collier.

A 12,000 Ton Floating Collier (Schwimmender Kohlenpeicher für 12,000 t.). W. Kaemmerer. An illustrated description of coaling apparatus built by the Temperley Transporter Co., for the harbor of Portsmouth. 1200 w. *Zeitschr d Ver Deutscher Ing*—Jan. 27, 1906. No. 75106 D.

## Colonial Service.

Vessels for Colonial Service. Sir Edward J. Reed. Read before the Inst. of Naval Archts. On the construction of new vessels, and the renewal of details. Deals with a variety of types. Ills. 1400 w. *Engng*—April 6, 1906. No. 76082 A.

## Compass.

The Principles of the Deviation of the Compass and Its Correction. L. M. Nulton. An attempt to explain, by simple laws of magnets, how deviation is produced by the iron of a ship, and how it may be corrected. An explanation of principles involved, based upon the physical laws of attraction and repulsion of magnets. Ills. 6400 w. *Pro U S Nav Inst*—June, 1906. No. 78028 G.

## Coupling.

The Lovekin Improved Inboard Coupling for Line and Propeller Shafts. Luther D. Lovekin. Considers a type of coupling being made for the U. S. battleship New Hampshire, explaining the advantages claimed. Ills. 1700 w. *Jour Am Soc of Nav Engrs*—May, 1906. No. 78027 H.

## Cranes.

New Tower Cranes for Shipbuilding (Neuere Elektrisch Betriebene Helling-Turmdrehkrane). Illustrating some remarkable traveling tower jib cranes of 6 tons capacity on towers 35 metres high; built by the Benrath Machine Works for Bremen shipyards. 2000 w. *Schiffbau*—July 11, 1906. No. 78156 D.

## Cruisers.

The Cruiser. Com. William Hovgaard. Gives a brief historical review with a view to studying the relation between the development and the causes which have produced and governed it, and discusses the type and design of cruisers most suitable to existing conditions. 9500 w. 4 plates. (No. 5.) *Soc Nav Archts & Marine Engrs*—Nov. 16, 1905. No. 73187 D.

## MARINE AND NAVAL ENGINEERING

### Cruisers

French Armored Cruisers. J. Peltier. Gives particulars of the types built since 1898, with illustrations. 1500 w. Marine Engng—April, 1906. No. 75857 C.

Peruvian Cruiser, Almirante Grau. Brief description of this twin-screw protected cruiser for the Peruvian Navy. 1000 w. Engng—March 23, 1906. No. 75912 A.

French Armored Cruiser. Ernest Renan. Illustrated detailed description of this recently launched vessel, the largest and most powerful yet laid down in France. 1700 w. Engr, Lond—April 20, 1906. No. 76452 A.

Steam Trials of H. M. Armored Cruiser "Cochrane." A report of trials, the results, so far as speed is concerned, proving quite satisfactory. 1200 w. Engng—July 13, 1906. No. 78216 A.

Trial Performance of United States Cruiser St. Louis. L. E. Baldt. An illustrated article giving a description of the vessel and its equipment, and of the trial trip. 4800 w. Int Marine Engng—August, 1906. No. 78201 C.

U. S. Armored Cruiser Tennessee. Lewis Hobart Kenney. Illustration, with detailed description of the machinery and tests. 12500 w. Jour Am Soc of Nav Engrs—May, 1906. No. 78026 H.

Description and Official Trials of the U. S. S. Washington. William A. Leavitt, Jr. Illustrated detailed description of the vessel, its equipment, and trials. 2500 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79480 H.

H. M. S. Natal. Illustrated description of this warship and its equipment. 1500 w. Engr, Lond—Aug. 24, 1906. No. 79019 A.

U. S. S. St. Louis. James Nelson Alexander. Illustrations, description, and report of official trial. 8000 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79478 H.

New Peruvian Cruisers. Illustrates and describes the "Almirante Grau," one of two sister ships recently built for the Peruvian navy. 1200 w. Engng—Sept. 28, 1906. No. 79707 A.

### Curiosities.

Curiosities of Naval Architecture—Round Ships and Globular Vessels. C. Field. Brief illustrated descriptions of vessels of these types constructed or proposed. 2500 w. Sci Am—May 5, 1906. No. 76499.

### Design.

Approximate Dimensions for a "Compromiseless Ship." Richard D. Gate-

wood. Aims to show how to design the principal dimensions of such a ship. 4500 w. Pro U S Nav Inst—June, 1906. No. 78030 G.

### Dry-Docks.

Floating Docks. Lyonel Edwin Clark. On types of floating docks, their advantages and capabilities, showing them to be thoroughly reliable and having in some cases distinct advantages. Discussion and correspondence. Ills. 51500 w. (No. 3500.) Inst of Civ Engrs. No. 73153 N.

The Wooden Floating Dry Dock at Mobile. Illustrations, with brief description. 700 w. Marine Engng—Nov., 1905. No. 72915 C.

A New Graving Dock at Nagasaki, Japan. Continued discussion of the paper by Naoji Sheraishi. 3000 w. Pro Am Soc of Civ Engrs—Jan., 1906. No. 74703 E.

The Cavité Drydock. Day Allen Willey. An illustrated article giving report of tests made and the arrangements for towing the structure to the Philippines. 1600 w. Sci Am—Jan. 6, 1906. No. 74195.

Docks for Torpedo Boats at the Imperial Yards at Kiel (Dockanlage für Torpedoboote auf der Kaiserlichen Werft Kiel). Ph. von Klizing. An illustrated description of the new floating docks built by the Howaldtswerk for the special purpose of overhauling torpedo boats. 2500 w. Zeitschr d Ver Deutscher Ing—Jan. 20, 1906. No. 75102 D.

Large Floating Docks (Les Grands Docks Flottants). L. Piaud. A general description of the modern self-docking sectional floating dock with illustrations of recent examples, including the docks at Hamburg, Cavite, and Tsing-Tao. Two articles. 5000 w. Génie Civil—March 17, 24, 1906. No. 76212, each D.

Floating Dry-Dock Construction. William T. Donnelly. Read before the Brooklyn Engrs' Club. Describes the floating dock and its operation, and illustrates various types. 2500 w. Int Marine Engng—Nov., 1906. Serial. 1st part. No. 80074 C.

The Naval Floating Dock—Its Advantages, Design and Construction. Leonard M. Cox. Principally a consideration of the floating dock, the choice of types, cost, etc. Ills. 15000 w. Pro Am Soc of Civ Engrs—Oct., 1906. No. 80099 E.

The New Rotterdam Electrically-Operated Floating Dock. Frank C. Perkins. Illustrations with brief description. 250 w. Sci Am Sup—Oct. 6, 1906. No. 79634.



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### Education

The Influence of Admission and Discharge of Water upon the Stability of Floating Docks (Ueber die Verminderung der Stabilität der Schwimmdocks durch die in denselben Vorhandenen Wasser-Ein-bezw.-Austrittsöffnungen). Alexander Dietzius. With diagrams showing the effect of various degrees of immersion upon the stability. 4000 w. Schiffbau—Nov. 22, 1905. No. 73870 D.

### Education.

See Industrial Economy.

### Engines.

See Mechanical Engineering, Steam Engineering.

See Mechanical Engineering, Combustion Motors.

### Electric Installations.

Electricity on Atlantic Liners. Illustrated description of the installation on the twin-screw steamship Amerika, showing the many applications made of electricity. 2300 w. Engr, Lond—March 23, 1906. No. 75908 A.

### Electric Power.

Applications of Electricity on War Ships (l'Electricité à Bord des Navires de Guerre). G. Maugas. A review of the applications of electricity on shipboard, including lighting, auxiliary motors, communication, etc., as well as the propulsion of submarines. 5000 w. Bull de la Soc Int des Electriciens—Dec., 1905. No. 75755 G.

### Electrical Devices.

Electricity in Service on British Battleships. Edward Nelson. An illustrated description of the electrical apparatus found on one of the British cruisers which recently visited New York. 2000 w. Elec, N Y—Dec. 6, 1905. No. 73546.

### Engine-Room.

Engine-Room Artificers. Editorial on the position of engine-room artificers in the Royal Navy. 2700 w. Engng—May 25, 1906. No. 77143 A.

### Evaporators.

Marine Evaporators. John Neill. Describes various makes, their construction and working, explaining the necessity which led to their adoption on all classes of steamships. Plate. 5500 w. Trans N-E Coast Inst of Engrs & Shipbldrs—Aug., 1906. No. 79256 D.

### Experimental Tank.

Ship-Model Experimental Tank at the Clydebank Shipyard. Reviews results of tank work, and gives an illustrated detailed description of this tank at Clydebank. 6000 w. Engng—April 27, 1906. No. 76570 A.

### Freeboards

Experimental Tank at Ann Arbor. Herbert C. Sadler. Illustrates and describes the tank and the method of preparation and testing of ship models. 2500 w. Marine Rev—June 7, 1906. No. 77207.

### Ferry-Boat.

Petrol Motor-Driven Ferry Boat "Swallow." Detail drawings with description. 900 w. Engng—Feb. 9, 1906. No. 75074 A.

The New Screw Ferryboats for the Long Island Railroad. Illustrated description of a vessel for service between Long Island City and James Slip, Manhattan. 500 w. Naut Gaz—Sept. 27, 1906. No. 79539.

### Ferry House.

Fireproof Ferry Structure of the Lackawanna. Illustrates and describes an interesting method of construction to be used in rebuilding the ferry terminal at West 23d St., New York. The difficulties are explained, and the method of fireproofing. 1800 w. Ry Age—March 23, 1906. No. 75817.

### Ferry Steamers.

American Train Ferry Steamers. Illustrates and describes types in service at San Francisco, New York, on the Great Lakes, and at other points. 1400 w. Engr, Lond—March 23, 1906. Serial. 1st part. No. 75907 A.

### Fire Boat.

Milwaukee's New Fire Boat. Profile and description of a new steel fire boat of the two-pumps class, equipped with a water tower. 800 w. Marine Rev—June 14, 1906. No. 77306.

A Large Motor Fire-Boat. Illustrated description of a powerful boat for Huelva, Spain. 600 w. Auto Jour—Sept. 1, 1906. No. 79111 A.

A New Motor Fire Boat. N. C. Cushing. Illustrates and describes a boat designed for using a gasoline engine in place of a steam engine. 1200 w. Int Marine Engng—Sept., 1906. No. 78823 C.

### Fire-Extinguishing.

Fire-Extinguishing Apparatus on Board Ship. Illustrated description of the fire-extinguishing apparatus installed on the S. S. Aydon, which uses sulphur dioxide gas in place of water or steam. 1100 w. Engr, Lond—Sept. 7, 1906. No. 79239 A.

### Freeboards.

Notes on the Freeboard Rules. J. Foster King. Read before the Inst. of Naval Archts. Notes upon an examination of

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### Gas Engines

the German Rules for Freeboard, and their bearing upon the general question. 4000 w. Engng—April 27, 1906. No. 76576 A.

### Gas Engines.

See Mechanical Engineering, Combustion Motors.

### Gas Power.

See Mechanical Engineering, Combustion Motors.

### Gas Propulsion.

See Mechanical Engineering, Combustion Motors.

### Gunboats.

Contract Trials of the U. S. Gunboat Paducah. A report of the standardization trials, and the performance on the preliminary trial. 1000 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73952 H.

### Gyroscope.

The Gyroscopic Action of Rotating Fly Wheels on Shipboard (Gyroskopischen Einfluss Rotierender Schwunräder an Bord von Schiffen). O. Schlick. A discussion of the practicability of employing heavy rotating wheels to lessen the rolling of ships. 3000 w. Zeitschr d Ver Deutscher Ing—Sept. 8, 1906. No. 79312 D.

### Harbor Vessel.

Harbor Service Vessel for the Midland Railway Company. Illustrations, with brief description of the "Wyvern" for service at Heysham Harbor. 200 w. Engng—Aug. 24, 1906. No. 79009 A.

### Ice Yacht.

How to Build an Ice Yacht. H. Percy Ashley. Illustrates and describes how to build for the 300-sq. ft. class, which has been found most practicable. The two types of solid backbone construction most in use are shown. 2000 w. Rudder—Nov., 1905. No. 73016 C.

### Indicator.

Depth Indicator for Torpedo Boats. Illustrates and describes an interesting apparatus devised by Elliott Bros. of London, based on results of experiments carried out by Harold Yarrow, of the firm of naval shipbuilders. 1500 w. Sci Am Sup—Sept. 29, 1906. No. 79505.

### Japan.

The Japanese Navy After the War. A report of the splendid results, with illustrations of the Russian warships refloated and captured. 2200 w. Sci Am—Dec. 16, 1905. No. 73727.

### Landing Stage.

The Landing Stage at Lome. Illustrated description of this landing stage on

### Liner

the coast of the Gulf of Guinea, constructed by the German Government. 1700 w. Engr, Lond—Nov. 24, 1905. No. 73608 A.

### Launches.

Problems in Connection with High-Speed Launches. Clinton H. Crane. Discusses the shape of the under water form; the skimming idea, and other points in design. Ills. 1500 w. Rudder—Dec., 1905. No. 73578 C.

The Fifty-one Foot Cruising Launch Anita. Illustrated description. 800 w. Marine Engng—March, 1906. No. 75331 C.

A Forty-Foot Cruising Launch. John Q. Walton. Description, with illustrations, of a recently completed vessel. 1300 w. Int Marine Engng—June, 1906. No. 76775 C.

The Steam Launch Rose en Soleil. Illustrated detailed description of this motor-boat which beat all competitors at the Liverpool trials. 1200 w. Engr, Lond—July 13, 1906. No. 78224 A.

### Launching.

The Launch of the "Lusitania." Illustrations and interesting account of the launch of the largest and heaviest ship yet floated. 2400 w. Engng—June 8, 1906. No. 77386 A.

### Lifeboats.

The Evolution of the Lifeboat. Capt. C. H. M'Lellan. A review of the development of the lifeboat, dating back to 1785, with illustrations. 2000 w. Marine Engng—Jan., 1906. No. 74020 C.

The Government's Gasoline Lifeboats. Illustrated description of the latest design of lifeboat constructed for the United States Life-Saving Service. It is of the self-bailing, self-righting, non-sinkable type, and has a 20-h. p. gasoline engine of the four cylinder, auto-marine type. 1500 w. Sci Am—March 17, 1905. No. 75555.

### Lighthouse.

Beachy Head New Lighthouse. Albert Havelock Case. Illustrated detailed description of this structure and its equipment. 5300 w. Ills. (No. 3461) Inst of Civ Engrs. No. 73176 N.

### Liner.

The Twin-Screw Liner "Amerika." Illustrations, with brief description of this new Hamburg-American steamship. 1500 w. Sci Am—Nov. 4, 1905. No. 72968.

The Construction of a Great Liner. A half-dozen illustrations showing clearly a great ocean steamship in the earlier stages of construction, with comments. 800 w. Engr, Lond—Dec. 8, 1905. No. 73908 A.

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### Liner

The Holland-America Liner Nieuw Amsterdam. Illustrated detailed description of this fine vessel, recently placed in service between Rotterdam and New York. 2800 w. Int Marine Engng—June, 1906. No. 76772 C.

The Launch of the Empress of Britain. Illustrated description of a fine vessel that is to be placed in service between Britain and Canada. 2200 w. Marine Engng—Jan., 1906. No. 74022 C.

The New Hamburg-American Liner Amerika. An illustrated detailed description of this large and luxurious steamer recently put in service. 1200 w. Marine Engng—Dec., 1905. No. 73515 C.

Cunard Turbine Liner Carmania. Illustrated detailed description of this large turbine steamer, its equipment, and report of trials. 8200 w. Marine Rev—Jan. 4, 1906. No. 74238.

The New P. & O. Liner Dongola. Benjamin Taylor. Illustrates and describes the latest vessel designed for the Eastern mail service, combining speed and spacious passenger accommodations. 1700 w. Marine Engng—Feb., 1906. No. 74831 C.

The New Amsterdam, Latest Transatlantic Liner, Reaches New York on Her Maiden Trip. Illustrated description of the new twin-screw steamship "New Amsterdam," of the Holland-America Line. 1800 w. Naut Gaz—April 19, 1906. No. 76160.

The Steamship Provence of the French Transatlantic Line (Le Paquebot "La Provence" de la Compagnie Générale Transatlantique). A. Dumas. With numerous illustrations of the latest addition to the French line. The displacement is 19,160 tons, and speed 21 knots. Serial. Part I. 1 plate. 2000 w. Génie Civil—April 7, 1906. No. 76219 D.

The Latest and Largest Steamship. Illustrates interesting features of the "Kaiserin Auguste Victoria," of the Hamburg-American line. 1000 w. Sci Am—June 16, 1906. No. 77285.

The New Cunarders. Sir William H. White, in the *London Times*. A discussion of steamship propulsion, and the increase in speed required for these new vessels. 2000 w. Marine Rev—July 12, 1906. No. 77953.

The Twin Screw Passenger and Freight Steamer Kaiserin Auguste Victoria (Der Doppelschrauben-Passagier und Frachtdampfer Kaiserin Auguste Victoria). A detailed description of the new Hamburg-Amerika liner, with numerous illustrations. Serial. Part 1. 1800 w. 1 plate. Schiffbau—June 27, 1906. No. 78155 D.

### Marine Railway

The Twin-Screw Steamship Kaiserin Auguste Victoria (Der Doppelschraubendampfer Kaiserin Auguste Victoria). W. Kaemmerer. A very completely illustrated account of the new Hamburg-Amerika liner, including details of the equipment and machinery. 4000 w. 4 plates. Zeitschr d Ver Deutscher Ing—July 7, 1906. No. 78110 D.

The Cunard Express Liner "Mauretania." An illustrated article giving description and full particulars in regard to the construction and equipment of this fine Cunard steamship. Plates. 7500 w. Engng—Sept. 14, 1906. No. 79449 A.

Cunard Express Steamer Mauretania. An illustrated article giving much information in regard to this new turbine steamer and matters relating to its construction. Plates. 6500 w. Engr, Lond—Sept. 21, 1906. No. 79591 A.

### Liverpool.

Liverpool and Her Rival Ports. From the presidential address of T. Reney Smith, before the Liverpool Engng. Soc. Discusses improvements whereby the city trade and progress may be advanced, especially questions connected with the shipping facilities. 2000 w. Engr, Lond—Nov. 10, 1905. No. 73297 A.

### Liquid Fuel.

Liquid Fuel for Naval and Marine Uses. George Melville. Gives a résumé of some of the important points covered by the report of the Board appointed to investigate the liquid fuel problem in its application to marine uses. 3000 w. Sci Am Sup—Feb. 3, 1906. Serial. 1st part. No. 74813.

### Machinery.

Useful Data of Scotch Marine Engineering Practice. H. Wilkes. Gives tables and diagrams giving figures based upon engines, boilers, and accessories actually constructed by Scotch and English marine-engine builders. 1000 w. Marine Engng—Nov., 1905. No. 72913 C.

### Machinery Weights.

Weights of Machinery. W. F. Sicard. A discussion of machinery weights in relation to shipbuilding, limited to what is commonly included in the term. 9200 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73950 H.

### Marine Engines.

A Compound Engine Design. Drawings and description. 1000 w. Marine Engng—Oct., 1906. No. 79467 C.

### Marine Railway.

The Overland Transport of Vessels by Marine Railway (Bemerkungen über den Trockentransport bei Schiffseisen bah-

# MARINE AND NAVAL ENGINEERING

## Marine Registry

nen). E. Wehrenfennig. With illustrations of a type of marine railway intended as a substitute for canal service, using inclined planes in place of locks. 1800 w. 1 plate. *Oesterr Monatschr f d Oeffent Baudienst*—April 21, 1906. No. 76834 D.

How to Build a Small Marine Railway. Charles G. Davis. An illustrated article describing in detail the construction of a railway for a yacht yard. 3800 w. Rudder—Sept., 1906. No. 79028 C.

## Marine Registry.

Bureaus for the Classification of Ships (Les Offices de Classification de Navires). An account of the origin and operations of the Bureau Veritas and of Lloyds, in the classification and registry of vessels. 3000 w. *Génie Civil*—Dec. 30, 1905. No. 74631 D.

## Merchant Marine.

The Merchant Marine. George W. Dickie. Address, at Portland, before the Trans-Mississippi Commercial Congress. Also editorial. Discusses the difficulties with which American shipbuilders must contend, and the shipping interests of the United States. 6000 w. *Marine Engng*—Nov., 1905. No. 72912 C.

Ships and Ports. W. H. Wheeler. Two articles showing what the requirements of the commercial mercantile marine of the future are likely to be, and giving a classification of the ports of Great Britain according to the requirements of trade, aiming to furnish a guide as to the capacity of harbor works, etc. 3500 w. 1st article. *Engr, Lond*—June 8, 1906. No. 77390 A.

The Merchant Marine as an Auxiliary to the Navy. Report of Admiral George Dewey. President-General Board, Navy Department, to the Secretary of the Navy. 2000 w. *Naut Gaz*—Dec. 28, 1905. No. 74110.

Upbuilding of Our Merchant Marine. F. W. Hibbs. Urging the establishing of the American merchant marine on an equal footing with other nations. 3800 w. *Marine Rev*—Dec. 28, 1905. No. 74096.

## Motor Boats.

A Six-Cylinder 400-Horse-Power Racing Gasoline Power Boat. Illustrates and describes a racing boat built by the Brooke Motor Co. of Gt. Britain. 900 w. *Sci Am*—Nov. 11, 1905. No. 73092.

Internal-Combustion Motors for Marine Service (Der Gasmotor im Dienste der Schifffahrt). C. Stein. A fully illustrated account of recent liquid-fuel motors and their accompanying mechanism for boat propulsion. Two articles. 6000

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w. *Zeitschr d Ver Deutscher Ing*—Oct. 28, Nov. 4, 1905. No. 73304 each D.

Problems in Connection with High-Speed Launches. Clinton H. Crane. Discusses points in design of boats driven by gasoline engines, especially the form of hull. 6 plates. 1500 w. (No. 15.) *Soc of Nav Archts & Marine Engrs*—Nov. 16, 1905. No. 73197 C.

Progressive Speed Trials of the Gasoline Launch Ludo. George Crouse Cook. Gives particulars and data of speed and power obtained on a well designed launch. 1600 w. 4 plates. (No. 16.) *Soc of Nav Archts & Marine Engrs*—Nov. 16, 1905. No. 73198 C.

Recent Motor Boats with Internal-Combustion Engines (Neuere Motorboote mit Verbrennungskraftmaschinen). W. Kammerer. Describing recent motor boats in England, France, and Germany. 3500 w. *Zeitschr d Ver Deutscher Ing*—Nov. 11, 1905. No. 73323 D.

The Sea-Going Motor Launch "Iris." Dimensions and illustrated description of the vessel and its equipment. 1500 w. *Engng*—Nov. 3, 1905. No. 73133 A.

A Suction Gas Plant Boat. From *Zeit. d. Ver. Deut. Ing.* Illustrates and describes the boat Lotte, used in the carrying trade between Cologne, Antwerp, and Rotterdam. 800 w. *Engr, Lond*—Dec. 1, 1905. No. 73693 A.

The Power Boat in 1905. W. P. Stephens. A review of the year, and the progress in the field of design. Ills. 3800 w. Rudder—Dec., 1905. No. 73577 C.

Review of the 1905 Autoboat Season. W. P. Stephens. A review of the races, regattas, carnivals, &c. 3000 w. *Automobile*—Jan. 11, 1906. No. 74361.

A Serviceable Twin-Screw Motor Boat. Thomas J. Fay. Illustrates and describes the principal features of a new twin-screw boat fitted with two separate power plants. 1200 w. *Sci Am*—March 3, 1906. No. 75320.

Hydroplane Boats: Latest Type of High-Speed Craft. William M. Meacham. An illustrated article describing the writer's experiments with submerged plates, which lifted the hull of the boat out of the water, thus lessening the resistance. 1600 w. *Sci Am*—March 3, 1906. No. 75319.

Sixty Miles an Hour on the Water. Ernest Archdeacon. Translated from *La Vie Automobile*. Describes the hydroplane boat constructed by M. le Comte de Lambert, more than two years ago, and comments on the value of the principles of its design. 1100 w. *Sci Am*—March 3, 1906. No. 75318.

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## Motor Boats

Steel Motor Boat for South America. Illustrated description of a steel hull, kerosene motor-propelled boat, built at Mariner Harbor, N. Y., for service on the Amazon River. 1000 w. Naut Gaz—March 1, 1906. No. 75345.

The "Spider" and the "Sandfly"—Two Shallow Draught Motor Boats. Illustrates and describes boats of very shallow draught; fitted with internal combustion engines. 700 w. Auto Jour—March 10, 1906. No. 75581 A.

A Paraffin Motor Launch. Illustrated description of a small launch built for the Soudan Government, intended for service at Khartoum. 700 w. Engr, Lond—May 18, 1906. No. 77020 A.

High-Speed Motor-Boats. James A. Smith. Read before the Inst. of Nav. Archts. Discusses the design and construction, mainly of high-speed launches with internal-combustion motors. Ills. 3500 w. Engng—April 20, 1906. No. 76454 A.

On Steering and Manœuvering of Power Boats. Norman L. Skeene. A study of the lateral plane, the action of the propeller, and the action of the rudder. Diagrams. 1700 w. Rudder—May, 1906. No. 76588 C.

Motor Boats. Bernard B. Redwood. Discusses the possibilities of the internal combustion engine for marine propulsion. Discussion. Ills. 7800 w. Jour Soc of Arts—March 23, 1906. No. 75891 A.

100-Horse-Power Suction-Gas - Propelled Boat on the River Rhine. Illustrated description of the boat "Lotte," a flat-bottomed barge measuring 139 feet 6 inches in length. It has proved highly economical in operation. 1000 w. Sci Am—April 14, 1906. No. 76036.

The Design and Construction of High Speed Motor Boats. James A. Smith. Excerpts from a paper read before the Inst. of Nav. Archts. Considers model types of high-speed launches, rendered possible by the development in internal combustion motors. 2200 w. Auto Jour—April 14, 1906. No. 76190 A.

The Speed of Motor Boats and Their Rating for Racing Purposes. Linton Hope. Excerpts from a paper before the Inst. of Naval Archts. Shows the great increase of speed since the internal combustion engine has been used, shows the use of motor boat racing in giving data applicable to the design and construction of hulls, and discusses racing rules. 2200 w. Auto Jour—April 14, 1906. Serial. 1st part. No. 76191 A.

Oil-Engines for Marine Purposes. Editorial on the uses made of the Diesel oil-

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engine for the propulsion of vessels. 1300 w. Engng—Oct. 5, 1906. No. 79803 A.

The Coming of Explosive Engines for Naval Purposes. C. M. Chester. Presents the advantages of these engines, reviewing recent papers bearing on this subject, and urging their speedy adoption for small vessels, such as torpedo-boats. Ills. 4300 w. Pro U S Nav Inst—Sept., 1906. No. 79845 F.

The Freight Boat Venoge on the Lake of Geneva (Der Lastdampfer Venoge auf dem Genfersee). P. Ostertag. A fully illustrated account of the use of the Diesel motor, and Del Proposto electric transmission system, as commercially applied to lake navigation. 1800 w. Schweiz Bauzeitung—Sept. 29, 1906. No. 79973 B.

## Naval Battery.

The Ultima—A Globuloid Naval Battery. Anson Phelps Stokes. Describes this proposed new naval battery, comparing with an earlier model, and giving report of experiments with a model in the Government Model Basin. 13 plates. 3000 w. (No. 7.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73189 C.

## Naval Engineers.

British Admiralty Policy and its Consequences. A discussion of the dissensions between the executive and the engineer officers in the British Navy, showing the insufficiency of the present Admiralty policy. 4000 w. Engineering Magazine—April, 1906. No. 75784 B.

The Efficiency of Engineering Personnel in the Navy. W. M. McFarland. A review of the natural consequences of the non-enforcement of the Personnel Law, and a plea for the discontinuance of the official discrimination between the two branches of the service in the United States Navy. 2500 w. Engineering Magazine—April, 1906. No. 75783 B.

## Naval Machinery.

Standardization of Naval Machinery. Deals with the standardization of the machinery of H. M. armored cruiser "Duke of Edinburgh," reporting trials. Ills. 3800 w. Engng—May 4, 1906. Serial. 1st part. No. 76667 A.

Suggestions for the Care and Operation of Naval Machinery in the Engineer Department U. S. Navy. H. C. Dinger. The first of a series of articles describing the main features in connection with the care and operation of naval machinery. 13500 w. Jour Am Soc of Nav Engrs—Feb. 1906. Serial. 1st part. No. 76348 H.

## Naval Station.

See Civil Engineering, Construction.

# MARINE AND NAVAL ENGINEERING

## Naval Training

### Naval Training.

The New Scheme of Training Naval Officers. A short account of the training given in the Royal Naval College, at Osborne; and abstracts from a recent "Statement of Admiralty Policy," referring principally to the training of engineer officers for the Navy. 6500 w. Engr, Lond—Dec. 8, 1905. No. 73912 A.

A New Scheme of Naval Training. J. A. Ewing. Lecture at the Royal Naval College, Portsmouth. Discusses the new scheme recently inaugurated in England, giving an account of its very satisfactory development and of the training at the colleges at Osborne. 4000 w. Engr, Lond—May 18, 1906. Serial. 1st part. No. 77022 A.

### Navies.

Comparison of the French and German Navies. J. Peltier. Gives a comparison from the report of the French Minister of Marine, with a supplement showing how the American navy compares with the other two. 1800 w. Int Marine Engng—June, 1906. No. 76773 C.

### Navigation.

Shaping the Course. Clarence E. Long. Describes the manner of safely conducting the navigation of any vessel from port to port. 4800 w. Marine Rev—May 17, 1906. Serial. 1st part. No. 76714.

### New Route.

Opening of a New Route to Ireland. An illustrated account of the new route opened from Fishguard to Rosslare. A scheme of the Great Western Company. The present article describes the Fishguard works. 4800 w. Engr, Lond—Aug. 31, 1906. Serial. 1st part. No. 79145 A.

### Oil Engine.

Two-Cycle Marine Oil Engine. Illustrated description of the new Sulzer-Diesel engine. 500 w. Engr, Lond—Oct. 12, 1906. No. 80063 A.

### Oil-Tight Work.

Oil-Tight Work in Ships of Light Construction. Herbert Rowell. Read before the Inst. of Nav. Archts. Describes experiments made to ascertain the spacing of rivets necessary to ensure oil-tight seams and connections in ship structures where circumstances rendered the use of thin plates and bars necessary. Records were also taken to show the capability of light structures of this nature to support relatively heavy pressures. Ills. 1600 w. Engng—June 15, 1906. No. 77489 A.

### Ore Carrier.

The Ore-Carrying Steamer Narvik (Der Erzdampfer Narvik). H. Herner.

## Progress

A fully illustrated description of a 6000 ton ore carrier on the Doxford turret model, built by Krupp for the transport of the Lapland iron ores from Narvik to Rotterdam. 1800 w. Zeitschr d Ver Deutscher Ing—May 5, 1906. No. 76807 D.

A Modern Ore-Carrying Steamer of the Great Lakes and Some Facts Regarding the Iron Industry in the West. Illustrated description of the new steamer Lyman C. Smith, of 6,200 gross tons, as a typical lake ore-carrier. 3500 w. Naut Gaz—Aug. 23, 1906. No. 78828.

### Paddle Steamships.

Early American Paddle Steamships. Gives a list of the principal paddle steamships built in the United States, with information concerning them. 1000 w. Naut Gaz—Feb. 1, 1906. No. 74830.

The American Paddle Steamship Golden Age. Illustrated description of a vessel built in New York in 1853, which made at that time record-breaking trips out to Australia and return across the Pacific. 2200 w. Naut Gaz—Feb. 1, 1906. No. 74820.

### Paddlewheel.

A Motor Paddlewheel for Small Boats. Translated from *La Vie Automobile*. Illustrates and describes a new stern wheel for propelling motor boats, recently experimented with in the Seine. 700 w. Sci Am Sup—Dec. 2, 1905. No. 73559.

### Piping.

On Piping and Powering of Ships. G. E. Smith. Discussion, with suggestions for the piping arrangements, and the arrangement of auxiliary machinery to secure efficiency and economy. Ills. 3000 w. Int Marine Engng—Sept., 1906. No. 78822 C.

### Ports.

Note on the Passage of Vessels in a Tidal River of Great Length. H. Crahay de Franchimont. Considers conditions needing study in planning the improvement of the depth of a navigable channel, and the preparation of route-charts. 1100 w. (No. 3579.) Inst of Civ Engrs. No. 73160 N.

The Ports of Antwerp and London. A comparison of the rival attractions of these ports, based on information from three recent reports. 1800 w. Engr, Lond—Oct. 27, 1905. No. 73010 A.

### Progress.

Technical Progress in the Merchant and Military Marine in the Last Decade (Die Technischen Fortschritte in der Handels und Kriegsmarine im Letzten Jahrzehnt). Hr. Ilgenstein. A review of the latest developments, including

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greater strength, stability and control; the use of electricity, telephones, wireless telegraphy, etc.; also submarines and torpedo boats. 4000 w. Zeitschr d Ver Deutscher Ing—June 23, 1906. No. 78105 D.

## Propellers.

Experience in the Design of Screw Propellers. Horace See. Read before the Milan meeting of the International Navigation Congress. A discussion of points in propeller design, giving the more desirable formations, and information of tests and conclusions. 1200 w. Eng News Nov. 2, 1905. No. 72963.

Experimental Researches on the Performance of Screw Propellers. W. F. Durand. A report of investigations carried on in the canal of the hydraulic laboratory of Cornell University, covering in effect the performance of 49 model propellers. 36 plates. 4800 w. (No. 3.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73185 E.

The Molding of Propellers. Outlines the two general methods of molding and casting the screw propeller—the use of the pattern and that of the sweeps. Ills. 4000 w. Int Marine Engng—76424 C.

## Propulsion.

The "Motogodille," a Motor Device for Propelling Small Boats. Illustrated description of an inexpensive and simple method of applying a small gasoline motor to boats. 500 w. Sci Am Sup—Jan. 27, 1906. No. 74574.

Some Problems in Ferry-Boat Propulsion. Col. E. A. Stevens. A report of tests made of model wheels of the Scranton, Scandinavia and Edgewater, in the United States experimental basin. 4 plates. (No. 1.) 700 w. Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73183 C.

Some Results of Tests of Model Propellers. A. V. Curtis, and L. F. Hewins. Presents results of experiments in two, four, and six-bladed propellers, at the U. S. Ex. Model Basin. 15 plates. 2000 k. (No. 4.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73186 D.

The Del Proposto System of Electrical Transmission Gear for the Propulsion of Ships by Irreversible Engines. Describes an electrical method of power transmission, more particularly intended for application to Diesel engines. Ills. 1700 w. Elect'n, Lond—Sept. 7, 1906. No. 79224 A.

Remarks on Screw Propulsion. R. D. Gatewood. A brief summary and discussion of the results of the theories and ex-

## Scouts

periments of Rankine, the Froudes (father and son), Taylor, Greenhill, and others. 2000 w. Pro U S Nav Inst—March, 1906. No. 76100 G.

## Protection.

Protection of Ships Against Torpedoes and Mines. Shows that existing methods of meeting torpedo or mine attack are all more or less defective, and gives the recommendations made by Dr. Blochmann, with the reasons. 4000 w. Engr, Lond—Oct. 19, 1906. No. 80143 A.

## Reconstruction.

Lengthening of the Steamer Hamilton. Alexander Wills. Illustrated description of this method of increasing the carrying capacity of a ship of the Old Dominion Steamship Co. 2000 w. Int Marine Engng—June, 1906. No. 76774 C.

## Refrigeration.

See Mechanical Engineering, Heating and Cooling.

## Revenue Cutter.

United States Revenue Cutter No. 15. Illustrated detailed description of a steam revenue cutter for service in the waters of Albemarle and Pamlico sounds, on the Carolina coast. 1500 w. Marine Rev—March 1, 1906. No. 75325.

A New Shallow Draft Revenue Cutter. Illustrates and describes a revenue cutter designed for use on Albemarle and Pamlico Sounds in North Carolina. 3500 w. Marine Engng—April, 1906. No. 75858 C.

## River Steamer.

The Hendrick Hudson. Illustrated detailed description of this recently launched vessel, said to be the largest river steamer in the world. 3300 w. Int Marine Engng—May, 1906. No. 76425 C.

## Salvage.

A Big Salvage Feat at Liverpool. Illustrates and describes an interesting work in salvage of a steamer beached in sinking condition in the Mersey. 600 w. Marine Rev—June 7, 1906. No. 77206.

First-Class Battleship Montezuma: Salvage Operations. An illustrated description of very difficult salvage operations, with map showing the location of the vessel. 5000 w. Engr, Lond—July 27, 1906. No. 78476 A.

## Scouts.

The New Scouts. C. C. P. Fitzgerald. Read at the Inst. of Naval Archts. Illustrations and information concerning these vessels, with general opinions on scouting and a comparison with 1901 design. 2200 w. Engng—April 6, 1906. No. 76080 A.

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H. M. S. Attentive. Illustration, description, and report of trial. 700 w. Engr, Lond—Dec. 22, 1905. No. 74157 A.

Scout Vessels for the United States Navy. Lieut. H. C. Dinger. Discusses the speed, endurance, and reliability of these vessels, their armament, habits, ability, structural strength, machinery, &c. 3800 w. Marine Rev—Jan. 11, 1906. No. 74343.

### Screw Propellers.

The Screw Propeller Controversy. James Howden. Explains why the subject is brought up and reviews the writer's previous papers and the discussions that followed their presentation, defending the writer's views. 16600 w. Trans Inst of Engrs & Shipbuilders in Scotland—Jan. 23, 1906. No. 75296 D.

### Shaft Torsion.

Torsion Indicator Diagrams of Marine Engines. A study of the investigations recently made in Germany upon the torsion of screw propeller shafts, with diagrams, showing the nature of the stresses. 3000 w. Engng—Jan. 26, 1906. No. 74892 A.

### Shipbuilding.

A New and Interesting Overhead Traveling Gear for Expediting Construction in Shipyards. Illustrates and describes a new system recently erected in a British yard, which is able to serve every part of the berth. 1000 w. Sci Am—Jan. 27, 1906. No. 74570.

A Shipbuilding Cableway. Illustrated detailed description of an ingenious application of the cableway to the building of ships, in use at Jarrow-on-Tyne. 1500 w. Engr, Lond—Jan. 19, 1906. No. 74757 A.

Shipbuilding and Marine Engineering in 1905. A review of these industries in the United Kingdom. 4000 w. Engr—Jan. 5, 1906. Serial. 1st part. No. 74419 A.

Shipbuilding for the Navy. Lord Brassey. Discusses the naval requirements of Great Britain, favoring the building of smaller vessels, distributing the guns in more ships. Abstract of discussion. 20500 w. Inst of Civ Engrs (No. 3562). No. 74357 N.

A Survey of Scotch Shipbuilding in 1905. Benjamin Taylor. A review of the striking developments of a very successful year. 2400 w. Marine Engng—March, 1906. No. 75330 C.

The Shipbuilding and Shipping Industries of Germany. J. Ellis Barker. Reviews the development of this industry in Germany, especially in the last thirty years. 6800 w. Contemporary Rev—March, 1906. No. 75568 D.

### Shipping Coal

Where the Ships Are Made. Arthur L. Rice. An illustrated description of the shops and power plant of the New York Shipbuilding Co., at Camden, N. J. 3000 w. Engr, U S A—Sept. 1, 1906. No. 79086 C.

### Ship Construction.

Pneumatic Tools as Applied to Ship Construction. C. Schofield. Abstract of a paper read before the N.-E. Coast Inst. of Engrs. & Shipbuilders. An explanation of the methods adopted in the American shipyards as to the application of pneumatic tools in ship construction. Ills. 2500 w. Mech Engr—Dec. 9, 1905. No. 73799 A.

### Shipping.

The American Shipping Question. Col. Robert J. Lowry. A discussion of conditions in the past and present, and the action needed to restore American mercantile ships to the seas. 1800 w. Marine Rev—Jan. 18, 1906. No. 74467.

Shipping on the Great Lakes. W. I. Babcock. Lecture at the Inst. of Technology, Boston. Describes the physical characteristics of the lakes and connecting waters, and the classes of boats the service requires, the immense amount of business, the methods of loading and unloading, etc. 6000 w. Marine Rev—Feb. 22, 1906. No. 75244.

Shipbuilding and Shipping at Nagasaki. Information concerning the last year's work at this Japanese yard, and the improvements and extensions recently made. 1200 w. Engng—Oct. 12, 1906. No. 80056 A.

Shipbuilding on the Great Lakes. Ralph D. Williams. A report of the work under order for this year's delivery, with illustrations of some of the vessels, and information concerning them. 1500 w. R R Gaz—Oct. 26, 1906. No. 80087.

### Shipping Bill.

Text of Shipping Bill. Gives the full text of the new ship subsidy bill which passed the Senate of the United States on Feb. 14. 3500 w. Naut Gaz—Feb. 22, 1906. No. 75243.

### Shipping Coal.

Coal-Shipping Appliances and Hydraulic Power-Plant at the Alexandra (Newport and South Wales) Docks and Railway, Newport, Mon. John Macaulay. Illustrated description of the appliances used and particulars of the tests made on the plant operating the appliances. 5000 w. Inst of Mech Engrs—July 30, 1906. No. 78561 D.



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Mechanical Appliances Used in Shipping of Coal at the Bute Docks, Cardiff. Henry S. C. Ree. An illustrated paper outlining the alterations, additions, and extensions necessitated by the accommodation required for vessels of larger size and for increased coal shipments. 4000 w. Inst of Mech Engrs—July 30, 1906. No. 78557 D.

Mechanical Appliances Used in the Shipping of Coal at Penarth Docks. T. Hurry Riches and Thomas E. Heywood. Illustrated detailed description of the coal-tips and their working, and other appliances. 1700 w. Inst of Mech Engrs—July 30, 1906. No. 78558 D.

### Shipyards.

Terashana—A Turkish Shipyard. An interesting description, showing the worthlessness of the yard, the financial condition, &c. 1300 w. Engr, Lond—Dec. 8, 1905. No. 73910 A.

Fore River Ship Building Company's Yard. An illustrated description of this modern yard, near Boston, with special reference to its electrical equipment. 2500 w. Marine Rev—May 3, 1906. No. 76515.

The Introduction of Cranes in Shipyards. Alexander Murray. Read before the Inst. of Naval Archts. Discusses improvements in shipyards and the results of efficient crane service, illustrating types introduced. 3200 w. Engng—April 13, 1906. No. 76302 A.

The Overhead Wire Cableway Applied to Shipbuilding. J. L. Twaddell. Read before the Inst. of Naval Archts. Principally an illustrated description of the system at the Jarrow Yard of Palmer's Shipbuilding and Iron Co., Ltd. 4000 w. Engng—April 13, 1906. No. 76306 A.

London Works, Renfrew. An illustrated description of works for building dredgers, barges, and dredger plants generally, with illustrated types produced. The works have recently been extended and rearranged. 2700 w. Engr, Lond—Feb. 16, 1906. No. 75280 A.

Scott's Shipbuilding and Engineering Works at Greenock. An illustrated article giving the history and description of an industry maintained for 200 years by one family, and in one locality. 6000 w. Engng—Feb. 9, 1906. No. 75071 A.

Lake Shipyard methods of Steel Ship Construction. Robert Curr. Describes the methods of doing the work on the J. Q. Riddle which was built and launched in forty-five working days, at Lorain. Ills. 2000 w. Marine Rev—Aug. 2, 1906. No. 78407.

See Mechanical Engineering Machine Works and Foundries.

### Speed Recorder

### Signaling.

Submarine Signaling. Henry R. Gilson. Reviews the experimental investigations made during the last twenty years in this field, especially the success attained by American investigators, describing the present signaling system and explaining some of the uses to which it may be applied. Ills. 6500 w. Tech Qr—Dec., 1905. No. 74585 E.

Submarine Signalling by Means of Sound. J. B. Millet. An account of the experiments in this field, and the invention as used and its operation. Also letters bearing testimony of its value and aid to navigation. Discussion. Ills. 5000 w. Jour Soc of Arts—May 4, 1906. No. 76653 A.

### Slipway.

Slipway at Tucacas, Venezuela. Arthur Drew Thomas. Short description, with illustration, of the construction of a slipway on the northern coast of South America. 1000 w. (No. 3511.) Inst of Civ Engrs. No. 73162 N.

### Snag Boats.

The Snag Boats of the South. Day Allen Willey. Illustrated description of a boat employed in the St. Louis district for removing these obstacles to navigation. 1400 w. Sci Am—June 9, 1906. No. 77254.

### Sounding.

A Long Wire Sweep for Soundings. D. B. Wainwright. Describes a sweep used in Frenchman's Bay, Me., and its operation. 1500 w. Eng Rec—Jan. 20, 1906. No. 74504.

### South Africa.

The Ports of South Africa—Cape Town and Durban. Reviews the history of harbor construction on the coast of South Africa, and describes the recent improvements. Map. 3000 w. Engng—Dec. 8, 1905. No. 73905 A.

### Spare Fittings.

Spare Gear for Steamers. F. J. Kean. Gives lists of spare gear customary at the present time for an ocean-going steamer to carry, discussing the necessity of carrying certain fittings. 1500 w. Prac Engr—Nov. 10, 1905. Serial. 1st part. No. 73277 A.

### Speed Recorder.

New Electrical Speed Recorder. H. C. Dinger. An illustrated description of the Monitor Speed Recorder, which aims to indicate accurately the rate of speed of a vessel. 4500 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73953 H.

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## Speed Trials

### Speed Trials.

Methods of Conducting Speed Trials. J. J. Woodward. Remarks on contract trial requirements, and a description of the methods of concluding speed trials under present conditions. Tables and plates. 20000 w. (No. 18.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73236 G.

### Stability.

Stability Calculations by Planimeter. R. E. Anderson. Discusses a proposed method which requires a planimeter of the least expensive type, and is based on the principle of the familiar property of the curve of displacement. 3000 w. Int Marine Engng—May, 1906. No. 76422 C.

### Steamboat.

New Steamboat Hendrick Hudson. Illustrated detailed description of this fine passenger vessel for service on the Hudson River, with report of the first trip. 6000 w. Naut Gaz—Aug. 30, 1906. No. 78961.

The American Steamboat Olympian, Ashore in the Straits of Magellan and Her Interesting Career. An illustrated article describing this paddle steamboat and giving its interesting history. 2000 w. Naut Gaz—Sept. 27, 1906. No. 79540.

Launch of New Steamboat Hendrick Hudson. An illustrated article giving an account of the launch and describing features of this vessel which will cost nearly a million of dollars. 3000 w. Naut Gaz—April 5, 1906. No. 75988.

Magnificent Steamboat for Great Lakes. Illustrations and brief description of a 400-ft. passenger steamboat to be built for the Detroit and Cleveland Nav. Co. 700 w. Naut Gaz—Jan. 18, 1906. No. 74483.

### Steamers.

A Wooden Passenger Steamer for Onedia Lake. Illustrates and describes a new passenger steamer, and its power equipment. 1600 w. Marine Engng—Feb, 1906. No. 74832 C.

The London County Council Passenger Steamers. Archibald Hogg. A criticism of the steamers designed for this service, with general discussion. Ills. 3000 w. Trans N E Coast Inst of Engrs & Shipbldrs—March 16, 1906. No. 76695 D.

The Turbine-Driven Channel Steamer "Viper." Illustration, with description and report of trials. The vessel is to be used in the mail service between the Clyde and Belfast. 800 w. Engng—May 18, 1906. No. 77014 A.

The Steamer Hoover and Mason. Illustrated description of the new lake ore

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carrier having transverse hoppers. 1100 w. Ir Age—Jan. 4, 1906. No. 74216.

New Passenger and Freight Steamer City of Stamford. Illustrated detailed description of a new steamer for service between New York and Stamford. 700 w. Naut Gaz—July 12, 1906. No. 77913.

The New Canadian Pacific Twin-Screw Steamers. An illustrated description of the Atlantic liners "Empress of Britain" and "Empress of Ireland." 3000 w. Engng—July 20, 1906. No. 78313 A.

A New Zealand Meat-Carrying Steamer. Benjamin Taylor. Illustrates and describes the twin screw steamer Orari, built for the frozen meat trade. 1000 w. Int Marine Engng—Nov., 1906. No. 80073 C.

The Fire-Proof Excursion Steamer Jamestown. Illustrated detailed description of a fine day passenger steamer intended for service between Washington and Norfolk, but now running in the excursion business on the Potomac River. 5000 w. Int Marine Engng—Nov., 1906. No. 80072 C.

The China Navigation Company's Steamer "Huichow." Illustrates and describes one of six vessels recently built for service between China, Australia, the coast and rivers of China. 900 w. Engng—Feb. 23, 1906. No. 75373 A.

The P. & O. Twin-Screw Steamer "Mooltan." A series of illustrations of the latest steamer of this company, with information concerning the progress of the company during the past 35 years. 2300 w. Engng—March 9, 1906. Serial, 1st part. No. 75600 A.

### Steamships.

New Steamships for Pacific Coast. Illustrated description of a design for two fine coasting vessels for service between San Francisco and Seattle. 1600 w. Naut Gaz—July 19, 1906. No. 78086.

New Canadian Steamer Cassandra. Illustration, with description, of a twin-screw steamer having novel features by which passenger space is transformed into cargo space and for the carrying of cattle, and *vice versa*. 1500 w. Engr, Lond—Sept. 7, 1906. No. 79240 A.

New Twin-Screw Steamship Mooltan. Illustrated description of this mail steamer built for service between the East Indies and England. 1300 w. Naut Gaz—March 29, 1906. No. 75867.

### Steam Trawler.

The New Steam Trawler Spray. Illustrated description of a typical North Sea steam trawler introduced among the fleets

# MARINE AND NAVAL ENGINEERING

## Steam Turbines

of Boston and Gloucester deep-sea fishermen, with an account of the method of catching the fish. 2000 w. *Naut Gaz*—Feb. 1, 1906. No. 74828.

## Steam Turbines.

See Mechanical Engineering, Steam Engineering.

## Stresses.

A Graphical and Analytical Method for Determining Transverse Stresses (Zeichnerisch-Rechnerisches Verfahren zur Bestimmung der Querbeanspruchungen). J. Stieghorst. A general study of transverse stresses, extending the theory for beams to include that for the frames of vessels. Four articles. 9000 w. *Schiffbau*—Aug. 8, 22, Sept. 12, 26, 1906. No. 79981 each D.

Stresses in Ships. John Smith. Read before the British Assn. An application of stream-line apparatus to determine the direction and approximate magnitudes of the principal stresses in certain parts of ships. Ills. 3300 w. *Engng*—Sept. 28, 1906. No. 79708 A.

## Submarines.

Petroleum Motor for Submarines. Illustrated description of a motor recently designed by Messrs. Körting Brothers. It is entirely without valves, the control of the admission and exhaust being regulated by the position of the piston. 900 w. *Engr, Lond*—Aug. 3, 1906. No. 78553 A.

Notes on Submarine Boats (Ueber Unterseeboote). C. Stainer. A general review of the development of submarine navigation, and a discussion of the present state of the art. 5000 w. *Stahl u Eisen*—Nov. 1, 1905. No. 73368 D.

Submarine Navigation. Sir William H. White. An address before the Roy. Inst. of Gt. Britain. Refers to efforts made as early as 1860, and reviews the progress and development, especially the modern types. The conditions to be met are described, and the equipment of such vessels. 5000 w. *Pop Sci M*—March, 1906. No. 75232 C.

Submarines. J. H. Tomb. A brief description of types, operations of, and accidents to submarines. 2200 w. *Pro U S Naval Inst*—Dec., 1905. No. 74718 G.

Submarine versus Submersible Boats. Simon Lake. Explains the important differences in these types of underwater boats, and the reasons for some of the accidents that have occurred. Gives diagrams of types and results secured by submersible boats. 4500 w. *Engr, Lond*—June 29, 1906. No. 77897 A.

The Stability of Submarines. Sir William H. White. Read before the Royal

## Torpedo

Society. A record of the results of calculations made to determine the conditions of stability of submarine vessels in varying circumstances which may occur in service. 3000 w. *Engng*—May 25, 1906. No. 77145 A.

The Two Modern Types of Submarines. E. L. Warren. An explanation of the methods in use to maintain neutral equilibrium as exemplified in the Holland and Lake types. 2000 w. *Yale Sci M*—June, 1906. No. 77372 C.

## Subsidies.

Shipping Subsidies. Royal Meeker. Abstract of an article in the *Pol. Sci. Qr.* A discussion of the subject of subsidies, concluding that there is no good economic reason for granting subsidies to the merchant marine either for construction or navigation. 3800 w. *R R Gaz*—Vol. XL, No. 3. No. 74456.

## Tail-Shafts.

Vickers' Appliances for Preserving and Lubricating Tail-Shafts. Illustrates and describes an arrangement for enabling oil to be used as a lubricant in the stern-tubes of steamers without its leaking away into the sea, and also preventing sand entering the stern-tube. 1500 w. *Engng*—May 4, 1906. No. 76669 A.

## Tender.

Steel Lighthouse Tender Tulip. An illustrated general description of a new single-screw steel lighthouse tender for Tompkinsville, N. Y. 2700 w. *Naut Gaz*—Oct. 25, 1906. No. 80118.

## Testing Tank.

The Testing Tank of the French Navy at Paris (Le Bassin d'Expériences de la Marine Française à Paris). L. Piau. A full account of the construction of the tank, the electric touring bridge and the machine for shaping the paraffine models. The tank is 135 metres long, 10 metres wide and 4 metres deep. 3000 w. 1 plate. *Génie Civil*—Sept. 8, 1906. No. 79323 D.

## Torpedo

The New Bliss-Leavitt Torpedo. S. D. V. Burr. Brief descriptions of the Howell torpedo, and the Russian torpedo, with illustrated detailed description of the Bliss-Leavitt torpedo. 2200 w. *Ir Age*—Dec. 14, 1905. No. 73720.

The New Turbine Torpedo of the United States Navy. Illustrated description of the Bliss Leavitt Model. 1800 w. *Sci Am*—Jan. 6, 1906. No. 74194.

The Protection of Ships of War against Mines and Torpedoes (La Protection des Navires de Guerre contre les Mines et les Torpilles). R. Blochmann. A study of

## MARINE AND NAVAL ENGINEERING

### Torpedo Boats

the lessons of the Russo-Japanese war; with suggestions as to the improvements in hull design, with reference to submarine protection. 2000 w. *Rev Gen d Sciences*—Jan. 30, 1906. No. 75769 D.

### Torpedo Boats.

Thornycroft 120-Horse-Power Gasoline-Propelled Torpedo Launch. Brief illustrated description. 600 w. *Sci Am*—Dec. 30, 1905. No. 74061.

Torpedo Boat No. 20, Goldsborough. G. H. Thayer. Detailed description, with report of official trial performance. 5000 w. *Jour Am Soc of Nav Engrs*—Nov., 1905. No. 73948 H.

Torpedo Craft for Scouting Purposes. Reviews the performance of this class of vessels, and discusses their fighting value, their requirements under the changed conditions, and the possibility of combining the qualities of torpedo craft and scouting vessels. 1500 w. *Engr, Lond*—Jan. 5, 1906. No. 74425 A.

The Future of Torpedo Craft. Archibald S. Hurd. Reviews the development of torpedo boat destroyers, illustrating types built, and discussing their value in warfare, and indicates some changes in construction of torpedo craft due to observations made during the Russian-Japanese war. 4000 w. *Cassier's Mag*—Feb., 1906. No. 74920 B.

The Yarrow-Napier Torpedo Boat. Illustrations, with description of a second-class motor torpedo boat recently launched 1100 w. *Auto Jour*—Jan. 27, 1906. No. 74869 A.

The Development of the Torpedo-Boat Destroyer. W. J. Harding. Read before the Inst. of Marine Engrs., England. Historical review. Ills. 2500 w. *Sci Am Sup*—March 24, 1906. Serial, 1st part. No. 75637.

Armorclads and Waterclads. Gives detail plans and description of a 20-knot 140-ft. seagoing subsurface torpedo boat, and presents its advantages as compared with the submarines. 2800 w. *Marine Rev*—June 7, 1906. No. 77205.

Some Accidents, Repairs, Etc., to the Vessels of the Torpedo-Boat Flotilla (November, 1901, to January, 1903), and of the First Torpedo Flotilla (January, 1903, to April, 1904). L. H. Chandler. A brief account of the more unusual matters of interest of this cruise. Ills. 5700 w. *Jour Am Soc of Nav Engrs*—Aug., 1906. No. 79479 H.

Types of French Torpedo Boats. Brief illustrated descriptions. 700 w. *Engr, Lond*—Sept. 7, 1906. No. 79241 A.

### Turbines

### Tow Boat.

Paddle Tow Boat Kaiser Wilhelm II (Radschleppdampfer Kaiser Wilhelm II). O. Heesch. Detailed description of a powerful paddle towing steamer for service on the Elbe with illustrations of hull and engines. 1200 w. 1 plate. *Schiffbau*—May 23, 1906. No. 77658 D.

### Towing.

Note on the Towing-Resistance of a Floating Dock. Henry Aylwin Bevan Cole. An investigation made to deduce approximately the towing-resistance of the dock from the indicator horse-power of the towing steamer. 1000 w. *Inst of Civ Engrs*—No. 3591. No. 79515 N.

### Transatlantic.

Transatlantic Lines and Steamships. Arthur J. Maginnis. Read before the Liverpool Engng Soc. A review of the past decade, and especially the advances of the last few years. 6000 w. *Marine Rev*—March 29, 1906. No. 75845.

### Transport.

The Military Transport Borussia (Der Truppentransportdampfer Borussia). Walter Hildebrandt. A fully illustrated description of the 7,500 ton transport recently completed at Kiel for the Hamburg-America Company. 2000 w. *Schiffbau*—March 28, 1906. No. 75762 D.

The Military Transport Steamer Borussia (Der Truppentransportdampfer Borussia). Hugo Buchholz. A detailed description of the steamer built at the Krupp Germaniawerft for the Hamburg-America Line, and adapted for military transport service in time of war. 3000 w. 1 plate. *Zeitschr d Ver Deutscher Ing*—June 23, 1906. No. 78103 D.

### Trials.

Analyses of the Trials of the Ferry-Boat "Scranton." Graduating thesis of A. H. Potbury, E. A. Stevens, Jr., and O. von Voigtlander, with introductory by Col. E. A. Stevens. Description of test, with tables, explanations of methods, etc. 4500 w. *Stevens Ind*—Jan., 1906. No. 75534 D.

### Turbines.

Marine Applications of the Curtis Steam Turbine. Charles G. Curtis. Information concerning vessels propelled by steam turbines of this type and the results obtained. 1500 w. (No. 12.) *Soc of Nav Archts & Marine Engrs*—Nov. 16, 1905. No. 73194 C.

Marine Steam Turbine Development and Design. E. M. Speakman. Reviews the rapid development that has taken place in Great Britain, compares turbines

## MARINE AND NAVAL ENGINEERING

### Turbine Propulsion

with reciprocating engines, and discusses their design. 30 plates. 8400 w. (No. 13.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73195 D.

The Determination of the Principal Dimensions of the Steam Turbine with Special Reference to Marine Work. E. M. Speakman. Read before the Inst. of Engrs. & Shipbuilders in Scotland. Discusses the design of turbine installations, the necessary calculation for propeller dimensions, &c. Ills. 3800 w. Engr, Lond—Nov. 17, 1905. Serial. 1st part. No. 73465 A.

The Turbine-Driven Steamer Viking. L. Ramakers. Illustrated detailed description. 1100 w. Marine Engng—Nov., 1903. No. 72911 C.

The History of the Marine Turbine. Reviews the history from the Turbinia of 1894 to the Carmania of 1905. Ills. 2800 w. Mach, N Y—Feb, 1906. No. 74801 C.

Marine Turbines in Service. Robert S. Riley. Discusses the turbine question and its advantages and disadvantages. 2500 w. Int Marine Engng—August, 1906. No. 78203 C.

See also Mechanical Engineering, Steam Engineering.

### Turbine Propulsion.

Development of the Marine Steam-Turbine. C. A. Parsons and R. J. Walker. Abstract of a paper read at meeting of the Inst. of Marine Engrs. 3000 w. Engng—Oct. 5, 1906. No. 79804 A.

### Turbine Steamers.

Recent Turbine Steamers. Illustrations and short descriptions of the Manxman, Princesse Elisabeth, Maheno, and a new vessel for King Edward VII. 2400 w. Marine Engng—Dec., 1905. No. 73516 C.

The Turbines of the "Carmania." Illustration of this new steamship, with description of the turbine machinery. 1500 w. Sci Am—Dec. 23, 1905. No. 73985.

The New Turbine Liner Carmania. An illustrated description of the largest turbine steamer yet constructed. 4000 w. Marine Engng—Jan., 1906. No. 74019 C.

Triple-Screw Turbine-Driven Cunard Liner "Carmania." A fully illustrated detailed description of this large vessel for service on the Atlantic, with report of trials. 15000 w. Engng—Dec. 1, 1905. No. 73688 A.

The Largest Turbine Steamship in the World. Archibald S. Hurd. A finely illustrated article giving a detailed description of the "Carmania" of the Cunard Line. 2000 w. Cassier's Mag—Jan., 1906. No. 74459 B.

### Turbine Steamers

The Trans-Atlantic Turbine Steamer Carmania (Der Trans-Atlantische Turbinendampfer Carmania). W. Kaemmerer. A general description of the propelling machinery, in comparison with that of the Caronia. 2500 w. Zeitschr d Ver Deutscher Ing—Jan. 6, 1906. No. 74607 D.

The Turbine Steamer Carmania (La Paquebot à Turbines Carmania.) L. Piaud. A fully illustrated general description of the new Cunard liner and her machinery. 2500 w. 1 plate. Génie Civil—Jan. 6, 1906. No. 74632 D.

The Cunard Liner "Lusitania." Editorial discussion of this recently launched British vessel, which marks a distinct advance in size, speed and method of propulsion. 3300 w. Engng—June 1, 1906. No. 77269 A.

The Cunard Liner Lusitania. With illustrations of the hull before launching and a view of the stern showing rudder and one of the propellers. Data concerning the powering and the general equipment of the vessel are also given, including electric lighting, telephones, etc. 1800 w. Sci Am Sup—June 30, 1906. No. 77710.

The Dover-Ostend Turbine Steamship "Princesse Elisabeth." Illustrations, description and report of trials. 1500 w. Bul Int Ry Cong—May, 1906. No. 77508 E.

Two New Turbine Steamers. Illustrates the "Kingfisher" and the "Duchess of Argyll," giving short description. 400 w. Engr, Lond—May 25, 1906. No. 77148 A.

The Present Status of the Turbine as Applied to Marine Work. Herbert C. Sadler. Discusses the requirements in marine propelling instruments and considers the suitability of the steam turbine to meet the conditions. 4500 w. Jour Assn of Engng Soc's—March, 1906. No. 77316 C.

Wrecking the George W. Elder. An interesting illustrated account of a very difficult but successful raising of this steamer which sank in the Columbia river, Oregon. 1500 w. Marine Rev—June 28, 1906. No. 77740.

Ocean Steamers with Steam Turbines. Brief illustrated descriptions of the five transatlantic turbine steamers, three of which are already in service, and two more being built, which will be the largest and most powerful steamships yet constructed. Also editorial discussion of the development of the turbine steamer. 8500 w. Eng News—Aug. 23, 1906. No. 78687.

The Turbine Steamers for the Fish-guard and Rosslare Service. Illustrated

## MECHANICAL ENGINEERING

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detailed description of the new high-speed turbine steamers built for the new service between the Pembroke Coast and Ireland. Plates. 2500 w. Engng—July 27, 1906. No. 78473 A.

Characteristics in Design and Arrangement of Marine Turbines and Propellers. Ernest N. Janson. Deals with the Parsons turbine when used for marine purposes. 8000 w. Jour Am Soc of Nav Engrs—Aug., 1906. No. 79484 H.

Combined Piston and Turbine Engines for Ships (Ueber Combinierte Kolbenmaschinen und Turbinenanlagen für Schiffe). Dr. H. Föttinger. With illustrations of various combinations of reciprocating engines for manœuvring, and turbines for direct propulsion. 4000 w. Zeitschr f d Gesamte Turbinenwesen—July 20, 1906. No. 79300 D.

The Belgian Turbine Steamship Princess Elisabeth (Der Belgische Turbinen Postdampfer Princesse Elisabeth). Details of hull, machinery and equipment of a turbine steamer for the mail and passenger service between Ostend and Dover. Serial. Part I. 4000 w. 1 plate. Zeitschr d Ver Deutscher Ing—Sept. 8, 1906. No. 79310 D.

Twin Screw Turbine Steamship Oriole. Illustrated detailed description of a steel steamship of the hurricane deck type, fitted with Curtis steam turbines. 3000 w. Marine Engng—Oct., 1906. No. 79466 C.

### Ventilation.

Experiments with Ventilating Fans and Pipes. D. W. Taylor. Describes experiments undertaken to determine the capacities and efficiencies of fans used for ventilation on U. S. naval vessels, and to obtain information for the design of systems of ventilation piping. 40 plates.

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(No. 2.) 11000 w. Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73184 F.

### Videttes.

High-Speed Vidette Pinnaces. G. Simpson. Illustrated description of videttes built for the Imperial Japanese Navy. 2000 w. Jour Am Soc of Nav Engrs—Feb., 1906. No. 76346 H.

### Warships.

Warship Construction. A review of warship construction during 1905 in Great Britain. 3800 w. Engng—Dec. 29, 1905. No. 74297 A.

The "Dreadnought." Editorial review of this recently launched vessel, said to be the most powerfully armed, the best protected, and the fastest battleship ever laid down. 4000 w. Engng—Feb. 9, 1906. No. 75075 A.

### Warship Design.

A Note from Japan. George W. Dickie. A note from a Japanese naval constructor is quoted, and the points named as of importance to gain a victory are discussed. 2 plates. 3000 w. (No. 8.) Soc of Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73190 C.

### Yachts.

The Race for the King's Cup. Concerning the race at Newport, Aug. 8, for the \$5000 gold cup presented by King Edward VII, with illustrations and information of the yachts entered. 2200 w. Sci Am—Aug. 18, 1906. No. 78621.

Steam Yachts: Some Comparisons. J. R. Barnett. Read before the Inst. of Naval Archts. Makes comparisons showing the most important changes made during the last twenty-five years. 2200 w. Engng—May 4, 1906. No. 76668 A.

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### Accidents.

Automobile Accidents—How to Avoid Them. Calls attention to causes of accidents between cars and automobiles, and between two automobiles. Ills. 1200 w. Automobile—Aug. 2, 1900. No. 78406.

### Adams-Hewitt.

The 10-H.P. Adams-Hewitt Light Car. Illustrated description of a powerful but low-priced car having many features of interest. 1000 w. Autocar—May 26, 1906. Serial. 1st part. No. 77124 A.

The Adams-Hewett Car. The first of a series of articles describing the details of this light, low-priced car. Ills. 900 w. Auto Jour—June 30, 1906. Serial. 1st part. No. 77881 A.

### Air-Cooling.

Practical Experiences with Air-Cooled Cars. Harry B. Haines. Gives some personal experiences with air-cooled machines on varying road conditions. 2800 w. Automobile—Nov. 2, 1905. Serial. 1st part. No. 73014.

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### Air-Cooled

The Problem of Air-Cooling Petrol Engines. Max A. R. Brunfer. An explanation of the scientific principles on which air-cooling is based, describing good examples of American practice. Ills. 3500 w. Autocar—Sept. 1, 1906. Serial. 1st part. No. 79113 A.

### Air-Cooled.

A 100-H.P. Two-Cycle Air-Cooled Motor. Illustrated description of a motor built for a western railroad which is the largest of this type built in the United States. 2000 w. Automobile—Dec. 7, 1905. No. 73637.

### Ambulance.

A Motor Ambulance for the United States Army. Waldon Fawcett. Illustrated description of a steam motor vehicle for hospital service. 900 w. Sci Am—Sept. 8, 1906. No. 79078.

### Arrol-Johnston.

The Arrol-Johnston Motor Car. An illustrated detailed description of the car which won the Tourist Trophy Race in the Isle of Man. 4000 w. Engng—Nov. 10, 1905. Serial. 1st part. No. 73289 A.

### Austin.

The Austin Petrol Cars. Begins an illustrated description of a British model, the leading characteristics, and details of construction. 1800 w. Auto Jour—May 5, 1906. Serial. 1st part. No. 76654 A.

The Austin 25-30 H. P. Car. Describes interesting details of these cars, illustrating the petrol tank arrangement. 2000 w. Autocar—April 28, 1906. No. 76555 A.

### Automobile Lessons.

Elementary Lessons on Motor Cars. K. D'Esterre-Hughes. The first of a series of six lectures which R. Sedgwick Currie gave before the Ladies' Automobile Club of Great Britain and Ireland. The subject of the present lecture is "The Engine." 2500 w. Autocar—Dec. 9, 1905. Serial. 1st part. No. 73796 A.

### Automobile Shops.

Where an Air-Cooled Car Is Built. Illustrated description of the factory of the H. H. Franklin Mfg. Co., Syracuse, N. Y. 1300 w. Automobile—June 21, 1906. No. 77450.

### Axles.

Automobile Front Axle Construction. Detailed discussion of front axles, their manufacturing methods, types of steering knuckles, etc. Ills. 2000 w. Automobile—Sept. 6, 1906. No. 79085.

### Ball-Bearings.

The Hoffman Ball-Bearings for Motor Cars. An illustrated article describing

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### Brakes

these bearings and the ball-bearing hub for cars of different types. 3000 w. Auto Jour—Jan. 13, 1906. Serial. 1st part. No. 74507 A.

### Bearings.

Ball Bearings—Good, Bad, and Indifferent. Henry Hess. Read before the Soc. of Auto. Engrs. in New York. Discusses the principle upon which the ball bearing is built, the friction, destructive wear, causes, and remedies. 3000 w. Automobile—May 31, 1906. No. 77061.

### Berliet.

The Berliet Petrol Cars. Illustrated detailed description of these chain-driven cars. 1000 w. Auto Jour—July 21, 1906. No. 78294 A.

### Bianchi.

The Bianchi Petrol Car. Illustrates and describes these Italian cars of the chain-driven type, with four-cylinder engines and four-speed gear boxes. 700 w. Auto Jour—Nov. 18, 1905. No. 73477 A.

### Bicycles.

The Pedersen Speed Gears for Bicycles. Illustrated description of this three-speed gear. 1500 w. Prac Engr—July 27, 1906. No. 78461 A.

Archdeacon's Air-Propelled Motor Bicycle. Brief illustrated description of this curious apparatus and its working. 500 w. Sci Am—Oct. 6, 1906. No. 79632.

The Pedersen Three-Speed Bicycle Gear. Illustrated description of an ingenious gear. 2000 w. Engng—May 11, 1906. No. 76764 A.

### Boilers.

Boilers for Motor Cars. Brief illustrated descriptions of various types used on steam motor cars. 400 w. Ry Age—Sept. 21, 1906. No. 79424.

### Brake Horsepower.

Brake Horsepower of Four-Cycle Motors. George W. Rice. Explains formula developed by the writer, and chart. 500 w. Automobile—May 24, 1906. No. 76796.

### Brakes.

Brakes of Various Types and Their Use. Maurice Pardet. Discusses various systems of braking in present use. 2000 w. Automobile—Jan. 4, 1906. No. 74205.

Methods in Brakes Seen at the Shows. Illustrated descriptions of interesting types. 1400 w. Automobile—Jan. 25, 1906. No. 74577.

Automobile Brakes (Automobilbremsen). R. Lutz. Giving details of the various types of brakes used by the leading builders of automobiles, and their applica-

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## Braking

bility as safety devices. 3500 w. Zeitschr d Ver Deutscher Ing—Feb. 17, 1906. No. 75702 D.

## Braking.

Use of the Motor for Braking. Rene M. Petard. Explains the advantages to be gained by using the motor of a gasoline automobile as a brake, and the most advantageous method of obtaining a braking effect. 1800 w. Automobile—Nov. 9, 1905. No. 73100.

## Brotherhood.

The "Brotherhood" Petrol Cars. Illustrated description of novel features introduced in the latest model. 700 w. Auto Jour—Nov. 18, 1905. No. 73478 A.

## Buggy Type.

Development of Buggy Type Western Cars. Harry W. Perry. The general characteristics of practical cars for use in the middle west of the United States are illustrated and described. The prices vary from \$250 to \$900. 3000 w. Automobile—Aug. 2, 1906. No. 78405.

## Cadillac.

The Four-Cylinder Cadillac—A New Vertical Model. An illustrated article giving a summary of the features of this 1906 model. 1200 w. Auto Jour—April 14, 1906. No. 76188 A.

The 10-H.P. Cadillac Car. Gives general views of the car and chassis, and of detailed parts, with descriptive notes. 1700 w. Auto Jour—Sept. 29, 1906. Serial. 1st part. No. 79680 A.

## Carbureter.

Packard Automatic Carbureter. Illustrated description of an interesting example of American carbureter practice. The carbureter is fitted with a hot-circulating water jacket. 900 w. Automobile—March 15, 1906. No. 75542.

The Carbureter and Its Functions. An explanation of the principles involved in modern carbureters, with remarks. Ills. 2000 w. Automobile—May 3, 1906. No. 76486.

Adapting the Carbureter Especially in Regard to Multi-Cylinder Engines. Suggestions resulting from observations of carbureter action. 2500 w. Autocar—July 7, 1906. No. 77967 A.

## Chainless.

The 14-22 H.P. Germain Chainless Car. Detailed description, with illustrations. 1500 w. Autocar—April 7, 1906. No. 76069 A.

## Chassis.

A Discussion of the 1906 Chassis. Forrest R. Jones. Discusses in detail the

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present automobile practice, especially in pleasure cars of the larger size. 3500 w. Automobile—Feb. 8, 1906. Serial. 1st part. No. 74928.

The 40-H.P. Crossley-Critchley Car. Illustrates and describes a fine example of English automobile engineering, shown at the Edinburgh Exhibition. 1400 w. Autocar—Feb. 3, 1906. No. 74982 A.

## Clement-Talbot.

The Clement-Talbot Petrol Cars. Principally an illustrated detailed description of the new 20-H.P. all-British vehicle, with general information in regard to the works and output of this company. 1200 w. Auto Jour—May 12, 1906. Serial. 1st part. No. 76753 A.

## Cleveland.

Cleveland 30-35 Horse-Power Model F. Illustrated detailed description. 1200 w. Automobile—Dec. 28, 1905. No. 74082.

## Clutches.

Improved Transmissions and Clutches. Illustrates and describes interesting improvements noticed at the recent New York shows. 5000 w. Automobile—Jan. 25, 1906. No. 74576.

Hydraulic Clutches — The Sparks-Boothby Clutch. Illustrated description of this clutch and its action. 1100 w. Auto Jour—March 17, 1906. Serial. 1st part. No. 75689 A.

## Cooling.

Air-Cooling Systems for Motors. An illustrated article describing methods of air-cooling used in America, and discussing the construction of types of air-cooled cylinders. 1500 w. Automobile—June 21, 1906. No. 77449.

Water-Cooling Systems for Motors. Explains reasons for the cooling process and gives brief illustrated descriptions of several systems. 1500 w. Automobile—June 14, 1906. No. 77275.

## Collisions.

Collision Forces in Automobiles. William F. Durand. Considers some of the conditions which determine the amount of destructive energy liberated. 4000 w. Automobile—Aug. 30, 1906. No. 78910.

## Commercial Vehicles.

The Fiat Commercial Vehicles. Illustrates and describes some details of these cars. 900 w. Auto Jour—Jan. 13, 1906. No. 74506 A.

## Competition.

New Serious Competitors of Electric Motor Cars. An illustrated article giving information concerning the trackless trolley used in Germany and France; the



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## Congress

motor omnibuses used in England, etc. 2000 w. Elec Wld—Sept. 8, 1906. No. 79197.

## Congress.

The III International Congress of Automobilmism at Milan (III Congresso Internazionale di Automobilismo in Milano). A series of reports by specialists upon the various departments of automobile construction as represented at the Milan exposition. Six articles. 10,000 w. L'Industria—June 3, 10, 17, 24, July 1, 8, 1906. No. 78179 each D.

## Construction.

Automobile Construction. F. C. Mason. The first of a series of articles which will give an illustrated description of a light gasoline touring car, and also a run-about which will be cheap and easy to build. 600 w. Am Mach—Vol. 28, No. 51. Serial. 1st part. No. 73977.

## Converting Apparatus.

Apparatus for Charging Storage Batteries. Illustrates and describes a device, especially suited to automobile battery charging, based on the discovery that the vapor given off by mercury when heated will provide a path for the passage of current in one direction only. 2000 w. Automobile—Dec. 14, 1905. No. 73761.

## Cost.

Why Some Automobiles are Expensive. H. F. Donaldson. An illustrated article explaining in detail the careful work on the best machines that so greatly increases their cost. 2800 w. Automobile—Aug. 16, 1906. No. 78608.

## Coventry Humber.

The 10-12 H.P. Coventry Humber Car. Illustrated description of the general arrangement, engines, rear axle, and control. 1600 w. Autocar—June 9, 1906. No. 77375 A.

## Crankshafts.

Crankshafts in Automobile Motors. An illustrated article explaining the parts of the typical crankshaft and giving various designs with descriptions. 1700 w. Automobile—Aug. 9, 1906. No. 78515.

A High-Grade Car-Motor Crank-Shaft. Hugh Dolnar. Illustrates and describes the crank-shaft of the American "Mercedes" car, and explains why copies of foreign cars cost more than the American cars. Ills. 1800 w. Am Mach—Vol. 29, No. 37. No. 79187.

## Crawshaw-Williams.

The 16-H.P. Crawshaw-Williams Petrol Car. Illustrates and describes a British touring car. 1500 w. Auto Jour—Feb. 24, 1906. No. 75361 A.

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### Daimlers.

English Daimlers for American Market. An illustrated description of the main features of these cars, which differ somewhat from the English form. 2000 w. Automobile—Nov. 30, 1905. No. 73506.

The New 45-H. P. Daimler Car. Illustrated description of the latest car of this company, which shows a number of departures from previous cars of this make. 2000 w. Autocar—June 2, 1906. No. 77258 A.

### De Dietrich.

The New 12-15 H.P. De Dietrich Car. Illustrated detailed description of the new chassis, the engine, &c. 800 w. Auto Jour—Nov. 25, 1905. Serial. 1st part. No. 73584 A.

### Decauville.

The 12-16 H.P. Decauville. Illustrates and describes the chassis of this car, which shows several distinctive and useful features. 2000 w. Autocar—July 21, 1906. No. 78293 A.

### De la Buire.

The De la Buire Cars. Illustrates and describes details of these interesting French cars. 2500 w. Autocar—May 19, 1906. No. 76985 A.

### Depreciation.

Car Depreciation. J. T. Ward. Discusses detail of depreciation and thinks as long as it does not exceed 15 to 20 per cent per annum it is not excessive. 1500 w. Autocar—April 21, 1906. No. 76434 A.

### Economy Test.

An Automobile Economy Test. An illustrated account of the recent test carried out by the N. Y. Motor Club, to demonstrate the efficiency of the American gasoline automobile. 1000 w. Sci Am—Nov. 18, 1905. No. 73204.

### Education.

An Automobile School. An account of a school opened in New York for training in the principles involved in the construction and operation of automobiles of all types. Ills. 1000 w. Sci Am—May 26, 1906. No. 76786.

### Electric.

The Electric Vehicle. Hayden Eames. Discusses its present status and its relation to the central station, the care needed and requirements. Ills. 3300 w. Elec Jour—May, 1906. No. 76705.

### Electric Vehicles.

Electromobiles. Henry F. Joel. A critical review of an article by Frank B. Rae

# MECHANICAL ENGINEERING

## Enfield

on "Speed-Time Curves for Automobile Motors," published in the *Electrical World and Engineer*. 1500 w. *Elec Rev, Lond*—Dec. 29, 1905. No. 74289 A.

Energy Consumed by Electric Automobiles. Alex. Churchward. Reports tests made with a special graphic recording meter designed by the General Electric Co. 900 w. *Automobile*—Jan. 11, 1906. No. 74360.

## Enfield.

The 30-H.P. Enfield Car. Illustrates and describes a recently built all-British car. 1000 w. *Autocar*—March 17, 1906. No. 75667 A.

## Engines.

Automobile Engines Considered from the Operative Point of View. Rodolphe Mathot. A scientific discussion of the design of the internal-combustion engine for the automobile, based on fundamental principles. 4000 w. *Engineering Magazine*. Jan., 1906. No. 73895 B.

Two-Cycle and Four-Cycle Engines. C. P. Malcolm. A discussion of the merits and demerits of the four-cycle and of the two-cycle engines. 3500 w. *Automobile*—Jan. 11, 1906. Serial. 1st part. No. 74358.

An 18-H.P. Six-Cylinder Rotary Petrol Engine. Illustrated detailed description of an interesting engine designed by F. Lamplough, for automobiles. 1600 w. *Autocar*—March 24, 1906. No. 75896 A.

Rating Petrol Engines by Cylinder Dimensions. Dugald Clerk. Read before the Auto. Club, England. Gives report of tests made, discussing results. 2000 w. *Auto Jour*—March 31, 1906. No. 76000 A.

The Rating of Motor Car Engines. Extracts from a lecture delivered by Prof. Hopkinson, of Cambridge University, to the members of the Midland Auto Club. Discusses the origin of horse-power, the factors, the source of power, inertia forces, piston speed, etc. 2500 w. *Autocar*—March 24, 1906. Serial. 1st part. No. 76001 A.

The Korting Paraffin Engine. Illustrates and describes a twelve-cylinder engine working in a special two-stroke cycle. 500 w. *Autocar*—May 5, 1906. No. 76656 A.

See Mechanical Engineering, Combustion Motors.

## Exhibition.

Motor Car Exhibition at Olympia. An illustrated review of this exhibition, its striking features, and more interesting exhibits. 3800 w. *Engr, Lond*—Nov. 24, 1905. Serial. 1st part. No. 73605 A.

## AUTOMOBILES

## French Designs

The Olympia Exhibition. A general account of this very successful automobile exhibition, with illustrations of many of the exhibits, and comments on the progress. 4500 w. *Auto Jour*—Nov. 25, 1905. No. 73582 A.

New Exhibits in Cars at Chicago. Illustrated detailed description of cars displayed which were not shown at New York. 6000 w. *Automobile*—Feb. 15, 1906. No. 75008.

The Progress of Automobilmism in 1905 (Les Progrès de l'Automobilisme en 1905). F. Drouin. A fully illustrated description of the Salon exhibition of the Automobile Club of France, with details of novelties in construction. Three articles. 6000 w. *Génie Civil*—Jan. 20, 27, Feb. 3, 1906. No. 75111 each D.

Cars and Airships at the Armory. An illustrated account of the opening of this show, describing some of the exhibits. 12500 w. *Automobile*—Jan. 15, 1906. No. 74450.

Garden Show a Beautiful Spectacle. An illustrated article describing some of the exhibits, their arrangement, and the scheme of decoration. 7800 w. *Automobile*—Jan. 18, 1906. No. 74449.

## F. I. A. T.

The F. I. A. T. Automobiles (Les Voitures Automobiles F. I. A. T.). F. Drouin. An illustrated account of the latest machines of the *Fabbrica Italiana di Automobili Terino*, with photographs of the motors, and the speed changing gear. 1200 w. *Génie Civil*—Sept. 1, 1906. No. 79320 D.

## Fire Appliances.

Motor Fire-Appliances for Vienna. Illustrations, with information of these self-propelled appliances. 1000 w. *Engng*—Nov. 10, 1905. No. 73287 A.

## Fittings.

Equipment for a Touring Car. The present number deals with articles that experience has shown to be desirable in the full equipment of a car for daily use about town. 2500 w. *Automobile*—June 28, 1906. Serial. 1st part. No. 77535.

## Franklin.

The Franklin for 1907 Makes Its Debut. Illustrates and describes the changes appearing in the new models. 1700 w. *Automobile*—Aug. 23, 1906. No. 78821.

## French Designs.

Comparative Analyses of French Design. W. F. Bradley. A comparative analysis of the 326 French cars shown at the Paris salon. 1000 w. *Automobile*—Jan. 11, 1906. No. 74359.

# MECHANICAL ENGINEERING

## French Practice

Motor Car Progress in France. The present article discusses the perturbed condition of the French industry and its causes, comparing English with French progress. 2000 w. Engr, Lond—Dec. 22, 1905. Serial. 1st part. No. 74156 A.

## French Practice.

Trend of French Practice in Construction. Rene M. Petard. Gives some conclusions drawn from tendencies observed at the Paris Salon. 2000 w. Automobile—March 29, 1906. No. 75839.

## Garage.

Model Garage in Harlem. Illustrates and describes a new storage station in upper Manhattan Island. 1000 w. Automobile—Nov. 23, 1905. No. 73428.

## Gasoline Cars.

How to Operate a Gasoline Car. Edward T. Birdsall. Points on starting, running, controlling, hill-climbing etc., are discussed. 2700 w. Automobile—April 26, 1906. No. 76370.

The Gasoline Car for Interurban Service. Extracts from a paper by F. W. Hild, read before the Iowa St. & Int. Ry. Assn. A review of the railway motor car and its capabilities; confined to internal combustion engines using gasoline as fuel. 3800 w. Ry & Engng Rev—June 2, 1906. No. 77087.

The Gasolene Car for Interurban Service. Extracts from a paper by F. W. Hild, read before the Iowa St. & Inter. Ry. Assn. Refers to various types of independent motor cars tried, and considers especially these cars as compared with the electric system. Concludes that they will prove useful in a field quite distinct from the standard electric system. 4800 w. R R Gaz—June 1, 1906. No. 77055.

## Gauge.

The T. & M. Tyre Gauge. Comments on correct inflation versus undue depreciation, and an illustrated description of this tyre tester. 1500 w. Auto Jour—Sept. 1, 1906. No. 79110 A.

## Gears.

The Humphrey-Scowen Gear Mechanism. Illustrations, with description. The chief features are the prevention of gear changing without declutching, and the facilitation of changing. 1200 w. Autocar—April 28, 1906. No. 76556 A.

Speed Changing Gears—The Planetary System. An illustrated explanation of the principles of its operation, and information relating to its use. 1800 w. Automobile—July 26, 1906. No. 78262.

Speed Changing Gears—The Sliding Gear. Diagram and description of typical three-speed and reverse sliding gear

## AUTOMOBILES

## Ignition

transmission with direct drive on the high speed. 2300 w. Automobile—July 12, 1906. No. 77912.

How the Bevel Gear Differential Works. An illustrated explanation of this type of differentials. 1200 w. Automobile—Aug. 16, 1906. No. 78609.

How the Spur Gear Differential Works. Gives diagrams and description of the working. 1000 w. Automobile—Aug. 23, 1906. No. 78820.

Speed Changing Gears—Individual Clutch. Illustrates and describes transmissions with internal individual clutches, with individual cone clutches, and an automatic gear-changing system. 1400 w. Automobile—Aug. 2, 1906. No. 78404.

## Heavy Vehicles

The Heavy Motor Vehicle Industrially Considered. John McGeorge. A comparative illustrated study of the advantages of electric propulsion as compared with steam and oil motors. 5000 w. Engineering Magazine—June, 1906. No. 76876 B.

## History.

The Forerunners of the Automobile. F. M. Feldhaus. Illustrates and describes devices used as early as 1447, and later. 2000 w. Sci Am Sup—March 31, 1906. No. 75828.

The Early History of the Automobile (Aus der Jugendzeit des Automobils). Conrad Matschoss. With illustrations of early steam vehicles, covering the period down to 1831. 5000 w. Zeitschr d Ver-Deutscher Ing—Aug. 11, 1906. No. 78712 D.

## Horse-Power.

Cubical Contents and Horse-Power. D. M. Weigel. A suggested method for calculating the actual power of engines by the cubical contents of their cylinders. 2000 w. Autocar—April 21, 1906. No. 76432 A.

## Hotchkiss.

The Hotchkiss Cars. A brief illustrated description. 1300 w. Autocar—May 5, 1906. No. 76655 A.

## Humber.

The Humber Petrol Cars. Illustrated descriptions of the four and six-cylinder models. 1200 w. Auto Jour—March 24, 1906. Serial. 1st part. No. 75894 A.

## Ignition.

Ignition Practice at the Shows. An illustrated review of European and American practice as noticed at the recent exhibitions. 5500 w. Automobile—Jan. 25, 1906. No. 74578.

Electric Ignition for Motor Cars. Frank

## MECHANICAL ENGINEERING

### Indicators

Little. Discusses both low- and high-tension systems and their operation. Ills. 2200 w. Elec Engr, Lond—Feb. 23, 1906. No. 75368 A.

A New Low-Tension Magneto. Illustrated description of the new system of ignition of the Albion Co. 1200 w. Autocar—June 9, 1906. No. 77374 A.

Ignition Devices for Automobile Motors (Die Zündvorrichtungen der Automobilmotoren). E. König. Discussing especially electrical ignition appliances, methods of timing the spark, comparing the advantages of the battery and the magneto. Two articles, 5000 w. Elektrotech & Polytech Rundschau—April 20, 27, 1906. No. 77659 each D.

The Ignition Timer and Its Functions. An illustrated description of the timer and its function. 1500 w. Automobile—May 31, 1906. No. 77062.

### Indicators.

Indicated Horse-Power and Indicators. Harold H. Brown. An explanation of the theoretical indicator and giving illustrated description of various types and of the "Manograph." 3500 w. Automobile—July 26, 1906. No. 78263.

### Industrial Vehicles.

Electric Vehicles for Semi-Public Service. Illustrated description of express wagons equipped with trolley pole and special electric motor, for using current from the over-head feed wires of street railway companies. 1300 w. Automobile—Dec. 14, 1905. No. 73760.

Motor Vehicles for Business Work. M. C. Krarup. Discusses the question of economy in using motor vehicles for transportation work, summarizing the matters which should be considered when their adoption is contemplated. 5500 w. Ir Age—March 1, 1906. No. 75299.

Report on the International Exhibition of Industrial Vehicles of August, 1905 (Rapport sur le Concours Internationale de Vehicules Industriels en Aout, 1905). Georges Lumet. A detailed report of the competitive trials of the Automobile Club de France with tables and diagrams of the results. 7000 w. Mem Soc Ing Civ de France—Nov., 1905. No. 75730 G.

The Commercial Motor Vehicle in Great Britain. Ernest F. Mills. An illustrated review of the progress of this industry in Great Britain, giving related information. 2500 w. Cassier's Mag—July, 1906. No. 77997 B.

Novel Commercial Vehicles in the Recent French Test. Illustrations of novel types, with short descriptions. 900 w. Sci Am—Aug 11, 1906. No. 78539.

### AUTOMOBILES

#### Iris.

Details of the "Iris" Touring Motor-Car. Many illustrations and descriptive notes. 2700 w. Engng—Nov. 17, 1905. No. 73483 A.

The "Iris" Cars. An illustrated article describing the leading features of cars recently redesigned. 1500 w. Motor Car Jour—Nov. 11, 1905. No. 73269 A.

The 1906 Legros and Knowles "Iris" Cars. Illustrated detailed description of two touring models recently brought out. 1500 w. Auto Jour—Nov. 11, 1905. Serial. 1st part. No. 73273 A.

The 25-30 and 35-40 H. P. Iris Cars. Illustrates and describes the frame, engine, carburetter, throttle valve, ignition system, change-speed gear, and other features of these British built cars. 2200 w. Autocar—April 14, 1906. No. 76187 A.

The Latest 25-30 H. P. Iris Cars. Praise for the Iris cars with illustrated description of alterations made in the design. 600 w. Auto Jour—June 16, 1906. No. 77470 A.

#### Kerosene.

Car Using Kerosene Oil as Fuel. Illustrates and describes a carbureter that will enable an ordinary explosion motor to run successfully on either gasoline or kerosene; and an air-cushion, which makes solid rubber tires as easy riding as pneumatic tires. 2200 w. Automobile—Nov. 9, 1905. No. 73099.

#### Knox

Knox Air-Cooled Motor-in-Front Car. Illustrated description of a new high-powered touring car with a vertical air-cooled motor in front, known as Model G. 1600 w. Automobile—Dec. 28, 1905. No. 74081.

#### Lamps.

New Ideas in French Lamps. Illustrates and describes the Besnard lamp and projector, and the Bleriot lamp burning gasoline and oxygen. 1000 w. Automobile—Nov. 30, 1905. No. 73505.

#### Lanchester.

The Twenty H. P. Four-Cylinder Lanchester. Illustrates and describes the engine, the countershaft, and the change speed mechanism. 1000 w. Autocar—Jan. 6, 1906. No. 74398 A.

#### Live Axle.

The Hedgeland Solid Live-Axle. An illustrated description of a device for eliminating the differential-gear in cars (chain-driven as well as live-axle), which is being officially tested, and for which non-skidding properties are claimed.

# MECHANICAL ENGINEERING

## Locomobile Models

2200 w. Auto Jour—April 14, 1906. No. 76189 A.

## Locomobile Models.

Locomobile Features of Construction. Illustrates and describes details of the two models for 1906. They are side-entrance touring cars, side-chain driven, with four-cylinder vertical water-cooled motors. 3000 w. Automobile—Jan. 4, 1906. No. 74206.

## Lorry.

A New Steam Lorry. Illustrated description of a 40-h. p. steam lorry and its engine. 900 w. Engr, Lond—March 2, 1906. No. 75513 A.

The Hay Ratchet-and-Pawl-Propelled Steam Lorry with Crankless Engine and Gearless Drive. Illustrated description of a new type of motor vehicle, showing an absence of any cranks or crankshaft to the engine, the elimination of change-speed gearing and its complications, and the perfection of a system of propulsion by ratchet and pawl. 1200 w. Sci Am Sup—Aug. 4, 1906. No. 78427.

## Lubrication.

Lubrication Systems for Automobiles. Considers the importance of lubrication in internal combustion motors, the special oils and method of applying. Ills. 2000 w. Automobile—Oct. 18, 1906. No. 79865.

The Lubrication of Cars. H. O. Duncan. Considers the essentials in a lubricant, the effects of inferior oil, and the French system of protecting their special brands. 1800 w. Autocar—Oct. 13, 1906. No. 80037 A.

Lubrication and Its 1906 Forms. An illustrated article describing the oilers and present practice for lubricating automobiles, as shown at the recent New York exhibitions. 3300 w. Automobile—Feb. 1, 1906. No. 74842.

## Lubricator.

The Albion Mechanical Lubricator. Calls attention to the tendency toward over-lubrication and the disagreeable results, and gives an illustrated description of a device designed to overcome these features and yet ensure efficient lubrication at all times. 1000 w. Motor-Car Jour—Nov. 11, 1905. No. 73270 A.

The Albion Mechanical Lubricator. Illustrates and describes the ingenious lubricator fitted to all Albion cars, invented by T. Blackwood Murray. 600 w. Autocar—Oct. 28, 1905. No. 73000 A.

## Lucas.

A Car with a Valveless Motor. Illustrated description of a Lucas Car with

## AUTOMOBILES

## Motor

its two-cycle engine and its working. 2000 w. Autocar—Feb. 24, 1906. No. 75364 A.

## Magneto.

The Holley High-Tension Magneto. Illustrated description of a particularly interesting magneto. 1400 w. Automobile—Jan. 11, 1906. No. 74364.

## Manograph.

Indicating an Auto Motor at 1000 R. P. M. H. F. Donaldson. Illustrated description of an instrument, called a "manograph," which gives a photographic record of the work of the motor. Its operation is explained. 2500 w. Automobile—July 5, 1906. No. 77803.

## Manufacture.

The Making of an Automobile. An illustrated article outlining the methods of an up-to-date automobile manufacturing establishment. 1600 w. Automobile—April 26, 1906. No. 76371.

## Materials.

Materials for Automobile Construction. Thomas J. Fay. From a paper read before the Soc. of Auto. Engrs. in N. Y. Information on requirements for materials needed for various parts of automobiles. 2800 w. Automobile—June 28, 1906. No. 77534.

## Matheson.

Self-Starting is a Feature of This Car. An illustrated description of the starting device of cars built in Wilkes-Barre, Pa. 1700 w. Automobile—May 24, 1906. No. 76707.

## Mechanical Plant.

Mechanical Plant in the Motor Mart of Boston. Howard S. Knowlton. Describes a building for the storage, repair and sale of motor vehicles, the power plant and mechanical equipment. Ills. 2500 w. Engr, U S A—April 16, 1906. No. 76127 C.

## Modern Cars.

"Small" and "Popular-Priced" Cars. Rene M. Petard. Begins an illustrated discussion of modern cars of the types named. 2200 w. Automobile—Jan. 15, 1906. Serial. 1st part. No. 74451.

## Morgan.

A New All-British Car. An illustrated description of a 24 h. p. Morgan car. 1800 w. Autocar—Nov. 11, 1905. No. 73272 A.

## Motor.

Four-Cylinder Motorcycle Engine (Viercylinder - Fahrradmotor). Bruno Müller. Detailed illustrations of 3 horsepower four-cylinder motor for motor cycles, built at the National Firearms

# MECHANICAL ENGINEERING

## Motor Cars

Works at Herstal, Belgium. 2000 w. Elektrotech u Polytech Rundschau—May 30, 1906. No. 77661 D.

## Motor Cars.

Mechanical Features of Some of the Winning Cars in the Automobile Club of America's Two-Gallon Fuel Contest. Illustrated description of interesting features. 2000 w. Sci Am Sup—May 19, 1906. No. 76690.

The Horseless Carriage—1885-1905. Claude Johnson. A review of the first twenty years of the "petrol" movement, or of mechanical road locomotion. Discusses principally automobilism in the United Kingdom. General discussion. 21-000 w. Jour Soc of Arts—Feb. 16, 1906. No. 75268 A.

## Motor Cooling.

Motor Cooling Principles and Practices. L. M. Dieterich. An explanation of the characteristics of heat-conditions existing in an automobile gasoline motor, and the forms of cooling. 4400 w. Automobile—Jan. 11, 1906. No. 74363.

## Motor-Cycles.

The Design of the Motor Bicycle. Discusses the lines along which improvement is necessary. 1200 w. Engng—June 22, 1906. No. 77794 A.

## Motor Omnibus.

The Motor-Bus and the Motor-Car. Editorial discussing the essentials of design and construction of motor omnibuses to meet British requirements, and related matters. 3000 w. Engng—Aug. 3, 1906. No. 78552 A.

## Motor Races.

The Motor Races at Monaco. An illustrated account of the races with remarks on the development in motor craft. 5000 w. Autocar—April 21, 1906. No. 76433 A.

## Motor Skate.

The Motor Skate.—A New Thousand League Boot. Illustrates and describes the invention of M. Constantini, of an automobile skate driven by a small gasoline motor. 700 w. Sci Am—Feb. 10, 1906. No. 74950.

## Motor Sleigh.

A Simple and Speedy Motor Sleigh. Brief illustrated description of a machine recently constructed at Springfield, Ohio, said to be capable of making 35 miles an hour on snow and 90 miles an hour on ice. 400 w. Sci Am—March 31, 1906. No. 75826.

## Motor Wagon.

A Powerful Motor Wagon with Four Driving Wheels. Illustrated descrip-

## AUTOMOBILES

## Omnibuses

tions of a motor vehicle in which all the wheels are utilized in driving, steering and braking. 1000 w. Eng News—July 12, 1906. No. 77928.

## National.

National 6- and 4-Cylinder 1906 Models. Illustrated descriptions of two new touring cars. 2000 w. Automobile—Feb. 1, 1906. No. 74843.

The 3-Cylinder "National" Car. Illustrated description of important improvements made in this British car. 1200 w. Auto Jour—Feb. 10, 1906. No. 75080 A. 1st part. No. 76753 A.

## Napier.

The 1906 Six-Cylinder Napier Cars. An illustrated article giving detailed information concerning the construction of these cars. 1000 w. Auto Jour—Jan. 13, 1906. Serial. 1st part. No. 74505 A

## Nevada.

Automobiling in the Desert. An illustrated article describing travel by automobiles in the mining regions. 2200 w. Min Wld—July 14, 1906. No. 77956.

## New Cars.

The Construction of the 1907 Peerless. Illustrates and describes the two new cars offered by this company, Nos. 15 and 16. 1200 w. Automobile—Oct. 11, 1906. No. 79744.

The Rapid Car. Illustrated description of the Italian-built Rapid, exhibited at the last Paris Salon. 2200 w. Auto Jour—Oct. 13, 1906. No. 80036 A.

The Waterless Knox for 1907. Illustrated description of a new touring car, with four-cylinder vertical air-cooled motor, rated at 25-30 h. p. Known as model H. 900 w. Automobile—Oct. 11, 1906. No. 79745.

## 1906 Models.

1906 Models at the Paris Salon. Rene M. Petard. Begins an illustrated description of many of the new models shown. 1700 w. Automobile—Dec. 28, 1905. Serial. 1st part. No. 74204.

## Olympia.

Some Leading Cars at Olympia. Illustrates and describes new models of various makes exhibited. 1500 w. Auto Jour—Nov. 18, 1905. Serial. 1st part. No. 73476 A.

## Omnibuses.

Gas-Electric Equipment for Fifth Avenue Bus. Illustrates and describes the motive power equipment of this thirty-passenger vehicle. 1500 w. St Ry Jour—Dec. 2, 1905. No. 73520 C.

Motor Omnibuses at the Olympia Exhibition. An illustrated review of the ex-

# MECHANICAL ENGINEERING

## Omnibuses

hibits, showing recent progress. 4500 w. Tram & Ry Wld—Dec. 7, 1905. No. 73973 B.

The "S 41" Type Petrol Omnibus. Illustrates and describes a type notable for the manner in which the engine may be used as a brake. 1200 w. Auto Jour—Dec. 9, 1905. No. 72797 A.

The Automobile Omnibuses of the General Omnibus Company of Paris. (Les Omnibus Automobiles de la Compagnie Générale des Omnibus à Paris). Col. G. Espitallier. A fully illustrated description of several types of omnibus under practical test in the public service in Paris. 3000 w. Génie Civil—Dec. 30, 1905. No. 74629 D.

The Critchley-Norris Petrol 'Bus. Illustrates and describes the special features of this chain-driven vehicle. 1400 w. Auto Jour—March 24, 1906. Serial. 1st part. No. 75895 A.

The Field of the Electric Tramway and Motor Omnibus. E. Manville. Read before the Automobile Club. A comparison of the advantages and disadvantages of the two systems, and of the costs. 5000 w. Elec Engr, Lond—April 13, 1906. Serial. 1st part. 76192 A.

30 Horse Power Motor Omnibus. Illustrates and describes the chassis of a powerful vehicle for service in London. 1200 w. Engr, Lond—March 23, 1906. No. 75910 A.

Motor Omnibuses for Public Passenger Service. R. G. L. Markham. An illustrated review of the history of motor vehicles for carrying passengers, their recent development and advantages. 3300 w. Cassier's Mag—May, 1906. No. 76483 B.

The "Electrobus" and Its Financial Prospects. Discusses the prospects of the electric omnibus in London, the running costs, re-charging expenses, cost of up-keep, mechanical features, etc. Ills. 2000 w. Auto Jour—April 28, 1906. No. 76558 A.

The 35-H. P. Napier Petrol 'Bus. Illustrated detailed description of the chassis, which is specially designed to take a double-deck 'bus body. 1000 w. Auto Jour—April 28, 1906. No. 76557 A.

The Transport of Passengers and Luggage by Heavy Motor Vehicles (Personen und Güterbeförderung mit Schweren Motorwagen). A. Heller. An illustrated discussion of the capabilities of the motor omnibus, showing vehicles used in Berlin, London and Brussels, with details of motors, tires, and gearing. Serial. Part I. 3000 w. Zeitschr d Ver Deutscher Ing—May 5, 1906. No. 76806 D.

## AUTOMOBILES

## Power

Public Service Motor Vehicles. W. Worby Beaumont. General descriptive remarks on the progress made in the development of the motor omnibus, illustrating and describing types. 3000 w. Tram & Ry Wld—June 7, 1906. Serial. 1st part. No. 77403 B.

Local Automobile Omnibus Service on the Coast of Normandy (Service Régional d'Omnibus Automobiles sur la Côte Normande). Lt. Col. G. Espitallier. With map of the routes, views of the machines, and an account of the development of the service. 3500 w. Génie Civil—Aug. 11, 1906. No. 79314 D.

### Operation.

Automobile Operation. Forrest R. Jones. A discussion of details liable to cause trouble in the operation, and the means of avoiding accidents, the care needed, and matters of general interest. 4000 w. Sib Jour of Engng—Oct., 1906. Serial. 1st part. No. 80003 C.

### Packard:

The Packard Presents Its 1907 Model. Illustrates and describes the chassis of the model known as "Packard 30." 2500 w. Automobile—Aug. 9, 1906. No. 78516.

### Paris Exhibition.

Novelties at the Paris Automobile Show. Illustrated descriptions of cars, motor boat, and new searchlight. 2700 w. Sci Am Sup—Jan. 27, 1906. No. 74573.

### Patents.

See Industrial Economy

### Peerless.

New Peerless Designs for 1906. Two new cars are to be placed on the market by this Cleveland, O., company, one of 30 h. p., the other 45 h. p. The 30 h. p. car is illustrated and described. 2000 w. Automobile—Nov. 23, 1905. No. 73429.

### Petrol-Electric.

The Auto-Mixte Petrol-Electric Car. Brief illustrated description of the Auto-Mixte system, exhibited at the Paris Salon. 700 w. Auto Jour—Jan. 6, 1906. No. 74394 A.

### Piston Pins.

What Is Wrong with Piston Pins in Automobile Engines—The Remedy. E. J. Bartlett. Explains the stresses the pin is subjected to and the methods of holding the pin as practiced in automobile work. Ills. 1200 w. Am Mach—Vol. 29. No. 40. No. 79617.

### Power.

Some Notes on Force and Power. John O. Crombie. Defines these terms and discusses their application to motor

## MECHANICAL ENGINEERING

### Pneumatic Hub

cars. Considers why a change speed gear is needed; the effect of changing gear ratios, etc. 2300 w. Autocar—Aug. 11, 1906. No. 78664 A.

### Pneumatic Hub.

The Middleton Pneumatic Hub. Illustrates and describes an invention for rendering solid-tired wheels more resilient. A pneumatic cushion surrounds the hub in much the same way that a pneumatic tire surrounds the felloe. 900 w. Auto Jour—Nov. 18, 1905. No. 73479 A.

### Race.

The Grand Prize of the Automobile Club of France for 1906 (Le Grand Prix de l'Automobile Club de France en 1906). Ch. Dantin. A description of the run over the circuit de la Sarthe, won by Sziisz, in a Renault machine. 3000 w. Génie Civil—June 30, 1906. No. 78123 D.

### Racers.

Final Races at the Ormond Automobile Meet. Illustrations of some of the record-holding racers, with report of their performance. 1700 w. Sci Am—Feb. 10, 1906. No. 74953.

### Racing Cars.

A Retrospect of the Vanderbilt Cup Race. A brief account of this race, illustrating some of the cars and scenes. 1500 w. Sci Am—Oct. 20, 1906. No. 79870.

The Elimination Car that Did not Start. Illustrated description of the Breese, Laurance & Moulton special racing car for the Vanderbilt Cup race. 500 w. Automobile—Oct. 18, 1906. No. 79866.

Machines in the Elimination Race for the Vanderbilt Cup. Illustrations of six of the eight different makes of machines, with description of some of them, and report of the result of the race. 2500 w. Sci Am—Sept. 29, 1906. No. 79501.

The Tourist Trophy Cars. Illustrates and describes cars entered for this race. 2000 w. Autocar—Sept. 1, 1906. No. 79115 A.

The Tourist Trophy Type of Car. Some consideration of the tabulated details of the cars entered for this year's race with comparison with 1905 cars, and description of some of the vehicles. Ills. 4000 w. Autocar—Sept. 15, 1906. No. 79436 A.

### Regent.

The 18 H. P. Four-Cylinder Regent-Car. Illustrated detailed description of this new car. 1200 w. Autocar—Aug. 25, 1906. No. 78989 A.

### AUTOMOBILES

#### Renault.

The Winning Car of the Grand Prix, and the Detachable Rim. Illustrated detailed description of this Renault car, and the removable system of wheel rims used. 1500 w. Sci Am—July 28, 1906. No. 78267.

The 10-14 H. P. Renault Car. Illustrated detailed description of the car recently supplied to H. M. King Edward. 1400 w. Auto Jour—Sept. 15, 1906. Serial. 1st part. No. 79434 A.

#### Richard-Brasier.

The Richard-Brasier Cars of 1906. Illustrates and describes the new features introduced. 1000 w. Auto-car—Jan. 6, 1906. Serial. 1st part. No. 74396 A.

#### Roads.

Roads for Motor Traffic. Editorial discussion of the speed and dust questions in regard to motor cars, and of the roads that will best remedy the latter; reviewing also the report of the Royal Commission on Motor-Cars. 3000 w. Engng—Sept. 14, 1906. No. 79451 A.

#### Rochet-Schneider.

The Rochet-Schneider Cars. Illustrated description of these cars which are made in several sizes. 900 w. Auto Jour—June 9, 1906. No. 77376 A.

#### Rolls-Royce.

Multi-Cylinder Rolls-Royce Cars—Two 8-Cylinder Models. Illustrated description of a landaulet, and a touring car having features of interest. 1500 w. Auto Jour—Nov. 11, 1905. No. 73274 A.

#### Runabout.

Reo Runabout with Folding Rear Seat. Illustrated description of an 8-horsepower American light car. 1500 w. Automobile—Dec. 14, 1905. No. 73763.

#### Russell.

The 16-H. P. Russell Car—A Canadian Petrol Vehicle. Illustrated detailed description of a light car built in Toronto. 2000 w. Auto Jour—Sept. 8, 1906. No. 79214 A.

#### Searchlight.

Motor Searchlight Equipment. Brief illustrated description of this plant built to the order of the Tyne Division of the Royal Engineers. 300 w. Auto Jour—Oct. 20, 1906. No. 80126 A.

#### Serpollet.

The Serpollet Steam Vehicles. Illustrated description of recently introduced features of these vehicles. 2200 w. Engr, Lond—Oct. 27, 1905. No. 73009 A.

#### Shock Absorber.

Pneumatic Shock Absorber for Ve-



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## Side-Drive

hicles (Amortisseur Pneumatique pour Voitures). H. Mamy. The Bernard & Patoureau device consists of an inflated cushion interposed between the spring and the body of the vehicle. 1000 w. Génie Civil—Oct. 28, 1905. No. 73315 D.

Types of American Shock Absorbers. Illustrates and describes devices for deducing the effect of shocks to the springs and body of a car when traveling rough roads. 3000 w. Automobile—Feb. 8, 1906. No. 74929.

Shock-Dampers. Explains the functions which these devices are intended to perform, describing the action and construction of some of the shock-dampers on the market. Ills. 2200 w. Auto Jour—July 28, 1906. Serial. 1st part. No. 78458 A.

## Side-Drive.

The 25-H. P. James and Browne Side-Drive Car. Gives an illustrated description of the design of a new side-drive car. 1200 w. Autocar—Nov. 18, 1905. No. 73480 A.

## Siddeley.

The Siddeley 32-Horse-Power Motor-Car. Illustrated description of the chassis and mechanism of this car which was exhibited at Olympia. 3500 w. Engng—Dec. 8, 1905. No. 73906 A.

The 32 H. P. Siddeley Car. Illustrated detailed description. 1200 w. Autocar—June 30, 1906. Serial. 1st part. No. 77883 A.

## Simplon Pass.

Opening of the Simplon Pass to Motorists. H. G. Archer. An illustrated description of this fine road and its construction, with some of the regulations governing self-propelled vehicles. 1500 w. Autocar—Aug. 18, 1906. No. 78833 A.

## Six-Cylinder.

Six-Cylinder Cars at the Shows. Illustrates and describes the six-cylinder cars shown at the recent exhibitions in New York. 3500 w. Automobile—Feb. 1, 1906. No. 74841.

## Six Wheels.

Vehicles with Six Wheels (Les Voitures à Six Roues). M. Le Gaurian. A description of the compensation suspension system of Capt. Lindecker, for distributing the load upon three axles, especially adapted for heavy vehicles. 4000 w. Ann des Ponts et Chaussées—4 Frimestre, 1905. No. 75779 E + F.

## Speed Gear.

A New and Compact Change Speed Gear. Illustrated description of the Hass-

## AUTOMOBILES

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ler transmission, for use with propeller shaft-drive. It concentrates the change-speed mechanism, the bevel driving gears, and the differential in a single housing on the rear axle. 1000 w. Automobile—Aug. 30, 1906. No. 78911.

## Speed Gearing.

The Lloyd Change-Speed Gear. Illustrated description of this gear and its operation. 1400 w. Autocar—Oct. 28, 1905. No. 72999 A.

## Specifications.

Specifications of Material Used in High-Speed Automobile and Motor-Boat Engines. Thomas J. Fay. Gives tabulated specifications of the qualities of materials used, with remarks. 900 w. Sci Am Sup—March 3, 1906. No. 75324.

## Spyker.

The 1906 Spyker Cars. An illustrated article describing the alterations introduced in the latest cars. 1800 w. Auto Jour—Feb. 3, 1906. No. 74981 A.

## Standard.

The 50 H. P. Standard Six-Cylinder Car. Illustrated detailed description of the constructional features. 2000 w. Autocar—Sept. 1, 1906. No. 79114 A.

## Steam.

The Steam Plant of the White Motor Car. R. C. Carpenter. Considers in detail this system, which is at present only applied to propulsion of motor cars, showing the economic results obtained by the use of steam of high pressure and high temperature. Ills. 3000 w. Sib Jour of Engng—June, 1906. No. 77324 C.

The Weyher and Richmond Steam Automobile (Automobile à Vapeur des Etablissements Weyher et Richmond). F. Drouin. Illustrated description of an 18 h. p. steam machine with flash boiler, engines, and chassis. 1500 w. Génie Civil—May 12, 1906. No. 77612 D.

## Steam Wagon.

The Sentinel Steam Wagon. Illustrated detailed description of a vehicle built in Glasgow and its engine. 1600 w. Engr, Lond—March 9, 1906. No. 75607 A.

Motor Car Show at Islington. Illustrates and describes a five-ton steam wagon exhibited, with several features of interest. The boiler is of the top-fired locomotive pattern. Other steam vehicles are mentioned. 2500 w. Engr, Lond—March 30, 1906. No. 76018 A.

## Steering.

Klee's Tangential Steering Gear. Illustrates and describes an invention designed to overcome a slight inaccuracy in

# MECHANICAL ENGINEERING

## Suggestions

systems having their front wheels interconnected by one tie rod of invariable length. 600 w. *Auto Jour*—Nov. 11, 1905. No. 73275 A.

Auto Drive, Steering and Skidding. L. M. Dieterich. A study of steering systems, with diagrams showing forces acting. 2000 w. *Automobile*—March 15, 1906. No. 75541.

Notes on the Steering of Automobiles. P. L. Renouf. Describes the Renouf system. Ills. 1200 w. *Autocar*—Oct. 20, 1906. No. 80124 A.

## Suggestions.

Unsolved Problems in Auto Engineering. Suggestions from an address by R. E. B. Crompton in London, in regard to possible modifications in automobile construction. 4500 w. *Automobile*—April 12, 1906. No. 76044.

## Sunbeam.

The Sunbeam Car for 1906. Illustrated description of a new design with a 16 H.-P. engine. The chains and brakes are arranged to operate continuously in oil baths. 2800 w. *Autocar*—Nov. 4, 1905. No. 73122 A.

## Talbot.

The 20 H. P. British Built Talbot Car. An illustrated article describing the engine, clutch, gear-box, etc. 1200 w. *Autocar*—Jan. 20, 1906. No. 74732 A.

## Taxation.

Motor Cars and Taxation. Discusses chiefly taxes or duties payable or proposed on motor cars in England. 2000 w. *Engr, Lond*—Sept. 21, 1906. No. 79589 A.

## Testing Plant.

Automobile Testing Plant at Purdue University. Brief illustrated description 500 w. *R R Gaz*—Vol. XL No. 4. No. 74583.

See Mechanical Engineering, Measurement.

## Thomas.

Thomas 50-Horsepower Flyer for 1906. An illustrated article describing the detail changes in designing the 1906 car. 1700 w. *Automobile*—Dec. 21, 1905. No. 73998.

## Tires.

Pneumatic Tires of the Clincher Type. Brief remarks on axle loads and tire sizes, and how dimensions are measured, with a consideration of clincher tires and their manipulation. Ills. 3000 w. *Automobile*—Aug. 9, 1906. No. 78514.

Some Notes on Pneumatic Tyres. Archibald Sharp. A discussion of some of the stresses and strains to which

## AUTOMOBILES

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tyres are subjected. 1500 w. *Autocar*—July 28, 1906. Serial. 1st part. No. 78459 A.

Hints on the Care of Pneumatic Tires. Suggestions in regard to the inflation and care of tires. 1200 w. *Automobile*—Sept. 27, 1906. No. 79486.

The Care of Pneumatic Tyres. F. J. J. Glynn. Explains the components of a pneumatic motor tyre, and gives suggestions for preserving their life and securing the best service. 1600 w. *Motor Car Jour*—Aug. 25, 1906. No. 78987 A.

## Touring Cars.

Chadwick Touring Car, 1906 Model. Illustrations and detailed description of an interesting machine built in Philadelphia. 2700 w. *Automobile*—Nov. 2, 1905. No. 73015.

New Columbia 28 H. P. Touring Car. Illustrated description of a new gasoline car to be known as Mark XLVI. Notes its interesting features. 2000 w. *Automobile*—Dec. 14, 1905. No. 73762.

## Touring Cars.

Dorris Touring Car Makes Its Debut. An illustrated description of a modern touring type, having a 4-cylinder vertical water-cooled motor of 26-30 h. p., sliding gear transmission and shaft and bevel gear drive. 1200 w. *Automobile*—Jan. 11, 1906. No. 74362.

High-Powered American Touring Cars. Illustrates and describes numerous types. 6500 w. *Sci Am*—Jan. 13, 1906. No. 74392.

Factors Contributing to Comfort in Autos. Translated from the French of H. André in *La France Automobile*. Discusses the influence of the engine, diameter and nature of wheels and tires, and body suspension. 3500 w. *Automobile*—April 5, 1906. No. 75943.

The 25-h. p. Straker-Squire "C. S. B." Touring Car. Begins an illustrated detailed description of this petrol-driven pleasure vehicle, especially the departures from usual practice. 1600 w. *Auto Jour*—Oct. 20, 1906. Serial. 1st part. No. 80125 A.

## Tourist Trophy.

The Race of the Day—The Tourist Trophy. An account of the origin and nature of this race, illustrating the cars of the recent contest and giving an account of the race and a comparison with last year's course, etc. 9000 w. *Auto Jour*—Sept. 22, 1906. No. 79573 A.

The Tourist Trophy Race, 1906. An illustrated description and discussion of the recent race. 12000 w. *Auto Jour*—Oct. 6, 1906. No. 79789 A.

## Tractors.

Petrol-Motor Tractors for Military Use.

## MECHANICAL ENGINEERING

### Trembler Coils

Illustrates and describes two lately constructed motor tractors, one of 40-brake-h. p. and the other of 25-brake-h. p. 700 w. Engng—Feb. 2, 1906. No. 74995 A.

The Scott Gasoline-Motor-Propelled Agricultural Tractor. Illustrates and describes an interesting tractor and its ingenious attachments, shown at the show of the British Royal Agricultural Society. 1000 w. Sci Am Sup—Nov. 4, 1905. No. 72973.

### Trembler Coils.

Adjustment of Quick-Acting Trembler Coils. W. H. Glaser. An explanation of the mode of action and especially describing the easiest and best way of making the adjustment in practice. 1200 w. Autocar—Jan. 6, 1906. No. 74397 A.

### Trials.

Tyre, Lamp, and Speedometer Trials. An illustrated account of these interesting trials now in progress. The cars are fitted with Collier tyres of different sections, each car carrying one or two speed indicators, and one or more lamps. 1800 w. Auto Jour—March 10, 1906. No. 75582 A.

### Troubles.

The Diagnosis of Motor Troubles. Harold H. Brown. Suggestions for locating troubles in four-cylinder motors. 2500 w. Automobile—Oct. 25, 1906. No. 80082.

### Truck.

The Four Wheel Drive Truck. Illustrated description of a new model, bevel gear-driven to both front and rear axles, there being no chains employed. 1000 w. Ir Age—Feb. 15, 1906. No. 75002.

### Using Tools.

Hints on Filing, Hardening and Tempering. Directions for the use of tools in making repairs on automobiles. 2500 w. Automobile—Oct. 4, 1906. No. 79608.

### Vanderbilt Cup.

The Winning Foreign Machines in the

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### Alcohol

Third International Race for the Vanderbilt Cup. Illustrates seven of the eight foreign makes which took part in this race, giving brief descriptions. 2800 w. Sci Am—Oct. 13, 1906. No. 79754.

See also Mechanical Engineering, Combustion Motors.

### War Automobiles.

New Armored War Automobiles. Illustrates and describes new types constructed in France and Austria, reporting experiments made at the maneuvering grounds. 1500 w. Sci Am—March 17, 1906. No. 75554.

See also Mechanical Engineering, Combustion Motors.

### Wheels.

The Spherola Spring Wheel. Illustrated description. The leading feature is that the springs are always equally compressed, so long as the wheel runs on a smooth road, and when meeting obstacles all the springs are utilized for absorbing the shock. 1200 w. Auto Jour—Sept. 1, 1906. No. 79109 A.

The Warley Spring Wheel. Illustrated description of a wheel where the springs are arranged radially in the vicinity of the hub in a very compact manner. 900 w. Auto Jour—Aug. 25, 1906. No. 78990 A.

### Winton.

Details of the 1907 Winton Model M. Line drawings and description of the engine, clutch and transmission mechanism and their working. 1500 w. Automobile—Sept. 20, 1906. No. 79408.

The 1906 Winton Cars. Begins an illustrated description of these cars in which the vertical type of engine has been adopted. 900 w. Auto Jour—Nov. 25, 1905. Serial. 1st part. No. 73583 A.

### Works.

The Daimler Motor Car Works. Illustrated description of these fine works which have recently been extended. 2500 w. Engr, Lond—May 4, 1906. No. 76664 A.

## COMBUSTION MOTORS

### Automobile Engines.

A Defect in the Motor and a Remedy. A. Gordon Ede. A proposition for increasing the power range of the engine by varying the compression. 2300 w. Autocar—March 10, 1906. Serial, 1st part. No. 75597 A.

Petrol Motors. A. Cyril Hutt. Read before the King's College Engng Soc. Considers single-cylinder motors, multi-cylinder engines, water cooling, valve gear, clutches, lubrication, carburettors, ignition, etc. Ills. 5200 w. Autocar—

Feb. 10, 17, 24, 1906. 3 parts. No. 75363 each A.

See Mechanical Engng., Automobiles.

### Alcohol.

The Industrial Uses and Value of Alcohol. Henry Hale. Mentions ways in which grain alcohol will take the place of other fluid when the tax upon it is removed, and discusses its importance as a producer of light, heat and power. 1700 w. Sci Am—June 23, 1906. Serial. 1st part. No. 77417.

The Use of Alcohol as a Fuel for Gas

## MECHANICAL ENGINEERING

### Alcohol

Engines. H. Diederichs. Considers the fuel value and the physical properties of alcohol, and the details of the alcohol engine, whenever they differ from the gasoline or crude oil machine. The efficiency and cost are also briefly discussed. Ills. 5000 w. *Int Marine Engng*—July, 1906. No. 77454 C.

Alcohol Fuel for Explosion Engines. Abstract translation of a paper by Karl Fehrmann, read before the German Auto. Tech. Assn. A report of investigations and results showing that the prospects of alcohol supplanting gasoline are not encouraging. 4500 w. *Mech Engr*—June 30, 1906. No. 77879 A.

Alcohol and the Future of the Power Problem. Elihu Thomson. Presents the advantages of alcohol as a fuel, and thinks where coal or oil can be obtained at the present costs they will not be replaced by alcohol. 1500 w. *Cassier's Mag*—Aug., 1906. No. 78569 B.

Alcohol as a Fuel in Explosion Motors. Thomas L. White. Begins a review of the properties of alcohol, considered as a fuel for explosion motors. 2200 w. *Automobile*—Sept. 20, 1906. Serial. 1st part. No. 79407.

Alcohol versus Petrol. A letter from Mr. Radford Cooke, reviewing the efforts made in foreign countries to introduce alcohol and facilitate its industrial use, urging the action of England in this matter. 2000 w. *Auto Jour*—Sept. 1, 1906. No. 79112 A.

Digest of the Regulations and Instructions Concerning the Denaturation of Alcohol. Gives those portions of the regulations of interest to the distiller and the proprietors of redenaturing plants. 4000 w. *Sci Am Sup*—Oct. 20, 1906. Serial. 1st part. No. 79873.

The Problem of Denaturing Alcohol. Thomas L. White. Discusses the losses due to denaturing, the selecting of a denaturant, the conditions to be desired and related matters. 2200 w. *Automobile*—Oct. 18, 1906. No. 79864.

### Balancing.

The Balancing of Multi-Cylinder Petrol Engines. An investigation made to inquire into the conditions which give rise to vibration, and the possibility of considerably reducing it by arranging the mechanism of petrol engines in such a manner as to ensure complete balancing of the inertia forces. 2000 w. *Engr, Lond*—Nov. 17, 1905. No. 73462 A.

Balancing of Petrol Engines. Archibald Sharp. Explains the principal phenomena involved in the "balancing" of the engine, in a manner intelligible to the

### COMBUSTION MOTORS

### Diagram

non-technical reader. 1800 w. *Autocar*—Jan. 27, 1906. Serial. 1st part. No. 74870 A.

### Carbureter.

A New Adjustable Float-Feed Carbureter for Use with Gasoline or Alcohol. Illustrates and describes a carbureter which has a coil spring, that acts as a throttle in connection with a slightly movable needle valve placed in the spraying nozzle. 700 w. *Sci Am*—July 21, 1906. No. 78060.

### Cooling Cylinders.

Cooling Cylinders by the Exhaust Gases. Describes a method of cooling an internal combustion cylinder, recommended by Rankin Kennedy for use on engines of moderate power per cylinder. 1200 w. *Autocar*—Aug. 18, 1906. No. 78834 A.

### Combustion Chamber.

Experiments on a Constant-Pressure Generator. C. M. Garland. A detailed description of experiments with a pressure generator, in which the products of combustion are mixed with steam generated by the heat of the combustion. 2500 w. *Engineering Magazine*—August, 1906. No. 78195 B.

### Crank Mechanism.

An Improved Crank Mechanism for Single-Acting Engines. Illustrated description of the Ramsey crank mechanism which has a number of advantages especially for the internal combustion engine. 2500 w. *Eng Rec*—Aug. 4, 1906. No. 78447.

### Cylinder Cooling.

A Rational Method of Cooling Gas-Engine Cylinders. S. M. Howell. Shows the disadvantages of water cooling and describes a novel water-jacketed, high-pressure cylinder for a compound gas engine, stating the advantages claimed. 1800 w. *Sci Am*—Jan. 20, 1906. No. 74441.

### Design.

Current Practice in Petrol Engine Design. G. W. Rice. Derives rational machine formulae for the different parts of a petrol engine with the constants of the formulae derived from practice. 2500 w. *Sib Jour of Engng*—May, 1906. Serial. 1st part. No. 77027 C.

### Diagram.

A New Work Diagram for Gases. Frank Foster. Describes a diagram devised to illustrate the actions of, and simplify the calculations for gas turbines, turbo compressors, gas engines, air compressors, and hot air engines. 2000 w. *Engr, Lond*—Dec. 1, 1905. No. 73694 A.

# MECHANICAL ENGINEERING

## Diesel Motor

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### Diesel Motor.

Oil Engines in the Sherman, Texas, Central Station. An illustrated description of the Diesel engine plant installed, and its performance. 1500 w. Elec Wld—July 28, 1906. No. 78335.

Application of the Diesel Motor to Navigation on the Lake of Geneva (Le Moteur Diesel et son Application à la Navigation sur le Lac Léman). P. Hoffet. A general account of the theory and high efficiency of the Diesel motor, with especial reference to the installation on the vessel "Venoge" on the lake of Geneva. 5000 w. Bull Tech de la Suisse Rom—June 25, 1906. No. 78173 D.

The Diesel Motor (Il Motore Diesel). A fully illustrated account of the manufacture and operation of the Diesel petroleum motor, with especial reference to the exhibits at Milan. Two articles. 4000 w. L'Industria—May 20, 27, 1906. No. 78178 each D.

### Engines.

Gas, Oil and Petrol Engines. Henry N. Bickerton. Abstract of a paper before the Manchester Assn. of Engrs. Reviews present practice in these engines, and matters relating to their working, economy, etc. Discusses several types. 4000 w. Mech Engr—March 17, 1906. No. 75698 A.

British Marine Oil and Spirit Engines. Edward Butler. Presents the advantages and disadvantages of vapor motors, and experience previous to the introduction of the explosion principle, and since, giving illustrated descriptions of various designs of motors. 7500 w. Rudder—May, 1906. No. 76587 C.

Four-Cylinder Reversible Internal-Combustion Engine. Illustrated description of a design of 4-cylinder vertical internal-combustion engine on the reversing type. 1200 w. Mech Engr—June 23, 1906. No. 77783 A.

Phenomena of the Working Fluid in Internal-Combustion Engines. Extracts from a paper by Dugald Clerk, at meeting of the Royal Society. An investigation of the specific heat of, heat-flow from, and other phenomena of the working fluid in the cylinder of the internal combustion engine. 2800 w. Jour Gaz Lgt—May 22, 1906. No. 77065 A.

### Feed Apparatus.

Liquid Feed Apparatus for Oil Engines. Illustrated description of a device for supplying liquid fuel to the carburetter of an internal-combustion engine. 700 w. Mech Engr—Aug. 25, 1906. No. 78994 A.

### Fuel.

The Fuel Question. A Suggestion. Rankin Kennedy. Suggests the possibility of using solid fuels, in a state of fine pulverization, for internal combustion engines. 1000 w. Autocar—Oct. 13, 1906. No. 80038 A.

### Furnace Gas.

Available Power and Cost of Operation of a Power Station for Waste Gases from a Blast-Furnace Plant. H Freyn. Gives calculations assuming a new blast furnace plant of two 400-ton blast furnaces, situated in the vicinity of a large city with facilities for water supply and handling material. Discussion. 14000 w. Jour W Soc of Engrs—Feb., 1906. No. 75420 D.

### Gas Cleaning.

The Cleaning of Blast Furnace Gas. F. E. Junge. A detailed study of the cleaning of power gas as illustrated by the installation at the works of the Lackawanna Steel Co., at Buffalo, N. Y., is given in the present number. Ills. 4000 w. Ir Age—Aug. 30, 1906. Serial. 1st part. No. 78867.

Methods of Cleaning Furnace Gases (Ueber den Gegenwärtigen Stand der Gichtgasreinigung). F. J. Meyjes. Illustrating a number of recent devices for washing furnace discharge gases to remove the dust and clean it for use as fuel for gas engines. 2500 w. Stahl u Eisen—Jan. 1, 1906. No. 74647 D.

### Gas Engines.

The Nuremberg Gas-Engine. Illustrates and describes the principal features of this gas-engine which has recently been built in very large sizes, and extensively adopted for running with blast-furnace gas, and other cheap gases. 900 w. Engng—Nov. 3, 1905. No. 73131 A.

The Various Methods of Governing Four-Cycle Gas Engines. Rodolphe Mithot. A comparison of the hit-or-miss method with those employing regulation of the charge. 3000 w. Engineering Magazine—Dec., 1905. No. 73374 B.

The Oechelhauser Gas-Engine. Illustrated detailed description of this large internal-combustion engine for utilizing the waste gases of blast furnaces and for working with producer gas. 2700 w. Engng—Jan. 5, 1906. Serial. 1st part. No. 74416 A.

Union Gas Engine of 250 Horse Power (Moteur à Gaz Union de 250 Chevaux). L. Ramakers. Illustrated description of horizontal double-acting gas engine, exhibited at Liège. 1000 w. 1 plate. Génie Civil—Dec. 30, 1905. No. 74630 D.

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New Acme High-Speed Vertical Tandem Gas Engine (Burt's Patents). Illustrated description. 1000 w. Mech Engr—March 3, 1906. No. 75496 A.

Rational Methods of Gas-Engine Powering. Sanford A. Moss. Gives general principles and rational formulas for the selection of the speed and cylinder dimensions of a gas engine to develop a given amount of power with a given fuel. Only four-cycle stationary engines are considered. 3000 w. Am Mach—Vol. 29, No. 12. No. 75642.

Some Recent Examples of the Use of Gas and Gasoline Engines in Marine Work. Illustrates and describes engines used in several vessels of diverse types. 3000 w. Eng News—March 22, 1906. No. 75648.

The Action of the Cylinder Walls of Internal-Combustion Motors (Comment s'Exerce l'Action de Paroi dans les Moteurs à Combustion Interne). L. Letombe. A study of the action of the cooling of the cylinder by water circulation, claiming that the efficiency of the engine is unaffected thereby. 4500 w. Mem Soc Ing Civ de France—Nov. 1905. No. 75727 G.

The Prime Mover of the Future. C. E. Sargent. Considers the internal combustion engine destined to be the prime mover of the future. Discusses its development, economy, etc. General discussion. Ills. 70000 w. Jour W Soc of Engrs—Feb., 1906. No. 75419 D.

Notes on the Design of Large Gas Engines with Special Reference to Railway Work. Arthur West. Remarks on engines suitable for important electric railway installations. Ills. 2300 w. Can Engr—April, 1906. No. 75922.

The Commercial Production of Nitric Acid in Connection with the Operation of Gas Engines. H. Diederichs. Reviews a lecture by Mr. Haessler, before the Society of German Engineers, presenting the main points of this proposition, and discussing experimental investigations. 2000 w. Sib Jour of Engng—April, 1906. No. 76390 C.

Some Notes on Gas Engines for Electric Lighting. R. C. Dieppe. Gives some points gained from experience which may be of use in ordering gas engines for electric lighting plants. 2000 w. Elec Rev, Lond—March 30, 1906. No. 76006 A.

Notes on Gas Engines (Ueber Gasmaschine). Alfred Menzel. A general review of gas power generation, including gas producers, engine details, regu-

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lation and operation. Three articles. 8000 w. Elektrotech u Maschinenbau—May 27, June 3, 10, 1906. No. 77656 each D.

Rational Methods of Gas-Engine Powering. Sanford A. Moss. Gives general principles for obtaining approximate results, and rational formulas for exact results if actual coefficients, etc., are known. Only four-stroke-cycle stationary engines are considered. 3000 w. Power—July, 1906. No. 77521 C.

A Heavy Duty Gas Engine Installation in the Carnegie Technical Schools' Plant, Pittsburgh, Pa. Illustrated detailed description of the four-cylinder double acting 500 H. P. engine. 2800 w. Ir Age—May 17, 1906. No. 76673.

Korting Gas Engine. Illustrates a 350-H. P. intermediate type, and a 250-H. P. engine embodying the latest modifications. 300 w. Engr, Lond—May 18, 1906. No. 77019 A.

Cycles, Design, and Regulation of Internal-Combustion Motors (Mode de Réglage, Cycles, et Construction des Moteurs à Combustion Interne). R. E. Mathot. A paper presented at the Liège Congress, giving an exhaustive review of the present state of the art. 15000 w. Revue de Mécanique—May 31, 1906. No. 78175 E + F.

Gas Engine Calorimetry. F. E. Matteson. A report of experiments made to determine the proportionate distribution of the heat. 1800 w. Am Mach—Vol. 29. No. 30. No. 78229.

Measurement of Friction in Gas Engines. A. H. Burnand. Explains a method of estimating friction by retardation curves, giving investigations made by the writer. 2000 w. Engng—July 13, 1906. No. 78220 A.

Some Large Gas-Engines. Illustrates and describes a large gas-engine, and gas-driven blowing-engines built in Germany. 1200 w. Engng—July 6, 1906. No. 77980 A.

A New Gas Engine By-Product. F. E. Junge. Discusses the new process proposed by Herr Häusser for making nitric acid by explosive combustion. 3000 w. Cassier's Mag—Aug., 1906. No. 78574 B.

Examination of Explosive Mixtures of Coal-Gas and Air. Editorial on the investigations of Dr. Ing. F. Häusser of the combustion in gas-engines. 1300 w. Engng—Aug. 3, 1906. No. 78550 A.

Gas Engine Efficiency. Carleton Ellis. Considers that most of the troubles with gas engines arise from the nature of the producer gas employed, and gives reasons for the opinion. 1200 w. Engr, U S A—Aug. 15, 1906. No. 78630 C.

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## Gas Engines

Gas Engines in Commercial Service. J. R. Bibbins. Read before the Ohio Soc. of Elec. & Steam Engrs. Briefly considers the cost of gas vs. steam and the advantages gained, the service of gas engines, their regulation, maintenance, etc. 2500 w. Engr, U S A—Aug. 15, 1906. No. 78629 C.

Formulas and Constants for Gas Engine Design. Sanford A. Moss. Rules are given for the size of all the more important parts; the formulas are rational whenever possible, and an effort has been made to arrange everything in the most convenient form for a designer's use. 2000 w. Mach, N. Y.—Feb., 1906. No. 74798 C.

Gas Engine Construction and Economy. Helon B. Macfarland. Gives tables showing the efficiency and the relation between thermal efficiency of the engine, the heating value of the gas, and the cubic feet of gas used by an engine. 1800 w. Engr, U S A—Feb. 1, 1906. No. 74861 C.

Gas Engines as Applied to Electric Driving. James Atkinson. Abstract of a paper before the Manchester Soc. of the Inst. of Elec. Engrs. Gives particulars of three sets of engines with suction-gas plants, with information concerning methods of governing, and the driving of alternating-current dynamos, etc. Ills. 4000 w. Mech Engr—Feb. 3, 1906. No. 74985 A.

Notes on Large Gas-Engines Built in Great Britain and Upon Gas-Cleaning. Tom Westgarth. Gives schedules showing the number and particulars of engines built or building by British makers, with illustrations of some of the installations, and information concerning gas-cleaning. 1200 w. Ir & St Inst—July, 1906. No. 78347 N.

Progress in the Construction of Large Gas Engines (Fortschritte und Erfahrungen im Bau von Grossgasmaschinen). H. Bonte. Discussing especially structural details, cylinder castings, bearings, valve-gear, etc. Serial. Part I. 4000 w. Zeitschr d Ver Deutscher Ing—Aug. 11, 1906. No. 78711 D.

The Application of Large Gas-Engines in the German Iron and Steel Industries. K. Reinhardt. Reviews the extent of the application of gas-engines in iron-works, and collieries in Germany; the working results, including the influence of purification on the gases; and present practice in the design of large gas-engines in Germany. Ills. 20500 w. Ir & St Inst—July, 1906. No. 78345 N.

The Applications of Large Gas Engines in German Manufacturing and

Mining Work (Die Verwendung von Grossgasmaschinen in Deutschen Hütten und Zechenbetrieben). K. Reinhardt. A statement of the nature and extent of the installations made in the past ten years, with details of latest improvement in construction. Serial. Part I. 7500 w. Stahl u Eisen—Aug. 1, 1906. No. 78732 D.

The Design of Blast-Furnace Gas-Engines in Belgium. Prof. H. Hubert. Reviews the history of the utilization of blast-furnace gas in engines, and the development of the present type of the Cockerill Company, giving a list of the engines built by this company as illustrating the progress in design and construction. 6000 w. Ir & St Inst—July, 1906. No. 78344 N.

The Ehrhardt & Sehmer Gas Engines. Illustrated descriptions of engines built in Germany by this firm. 1500 w. Ir Age—Aug. 9, 1906. No. 78481.

A New Design of Gas Engine. Illustrates and describes a new design of internal combustion engine, intended to show the most advanced practice. It is of the two-cycle, single-acting, scavenging type, adapted for operation with all classes of fuel, both liquid and gaseous. 2000 w. Eng Rec—Sept. 1, 1906. No. 78927.

Buckeye Gas Engine. Illustrated description of an engine for direct driving electric generators on suction producer gas. 1200 w. Ry & Eng Rev—Sept. 8, 1906. No. 79077.

Fundamental Principles of Gas Engines and Gas Producers. Robert T. Lozier. Read before the N. Y. Elec. Soc. Considers the commercial efficiency and economy of gas engines, explaining the working. Ills. 3000 w. Sci Am Sup—Sept. 18, 1906. Serial. 1st part. No. 79082.

Internal-Combustion Gas Engines. An outline of the findings of a committee of the Institution of Civil Engineers, appointed to investigate their efficiency. 2500 w. Jour Gas Lgt—Sept. 4, 1906. No. 79105 A.

Notes on Gas Engines. On the governing of gas engines. 1200 w. Elec Rev, Lond—Sept. 14, 1906. No. 79445 A.

Plain Story of an Internal Combustion Engine. Louis J. Buschman. An illustrated explanation of the principles which enter into the construction and operation. 2200 w. Automobile—Sept. 6, 1906. No. 79084.

Tests of a Gas Engine Operated by a Suction Producer. George H. Barrus. Gives description of the plant and the

# MECHANICAL ENGINEERING

## Gas Engines

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## Gas Power

tests made. 3500 w. Cassier's Mag—Sept., 1906. No. 79251 B.

What Makes the Gas Engine Run. E. W. Roberts. Explains the system of operations in the four-cycle type of engine, and the two-cycle type. 2500 w. Rudder—Sept., 1906. No. 79027 C.

Working Drawings of a 7 B. H. P. Gas Engine. Drawings and descriptive notes of a gas engine of the ordinary single-acting Otto type, using as fuel an average quantity of ordinary illuminating gas. 1200 w. Mech Engr—Sept. 8, 1906. No. 79229 A.

Gas Engines. Paul Windsor. Read at Columbus Convention of the Am. St. & Int. Ry. Engng. Assn. Deals with the experience that the Boston Elevated Ry. Co. has had with its two gas-engine plants. Ills. 1800 w. St Ry Jour—Oct. 20, 1906. No. 80030 C.

The Experience of the Boston Elevated Railway with Gas-Producer Engine Plants. Concerning two plants, radically different in equipment, installed with the idea of obtaining information by a practical test. They seem to show the economy and reliability of gas engine power stations. Plans. 1200 w. Eng Rec—Oct. 20, 1906. No. 79884.

The Injection of Volatile Liquids in Explosion Motors (Les Moteurs à Explosion et l'Injection de Liquides Volatiles). Dr. K. Schreber. A discussion of the thermodynamics of gas engines in which a volatile liquid is injected during the compression stroke. 5000 w. Rev Gén des Sciences—Aug. 30, 1906. No. 79926 D.

Large Gas Engines. H. A. Humphrey. A lecture delivered in connection with the Engineering and Machinery Exhibition at Olympia. A review of the features of the large gas engines made in England and on the Continent. 3700 w. Jour Gas Lgt—Oct. 9, 1906. No. 79854 A.

Molding and Patternmaking of an Automobile Gas Engine. E. F. Lake. An illustrated article comparing the advantages of two-cycle and four-cycle types, and discussing the influence of automobiles on the gas-engine business, the construction, materials, etc. 2700 w. Am Mach—Vol. 29. No. 40. No. 79615.

The Influence of the Cylinder Walls upon the Efficiency of the Gas Engine. (Influence de l'Action de Paroi sur le Rendement des Moteurs à Gaz). L. Letombe. An investigation of the head losses involved in cooling the cylinder, showing the advantages of high compression, and combustion at constant volume. 5000 w. Revue de Mécanique—Sept. 30, 1906. No. 79922 E+F.

## Gaseous Mixtures.

The Explosion of Gaseous Mixtures, and the Specific Heat of the Products. B. Hopkinson. A report of experimental investigations, comparing the results with the work of other investigators. 3300 w. Engng—June 15, 1906. No. 77485 A.

## Gases.

Development of the Theory for the Kinetic Energy of Gases. Gustaf M. Westman. A mathematical study, deducing formula. 2500 w. Jour Fr Inst—Oct., 1906. Serial. 1st part. No. 79731 D.

## Gasoline Engines.

Heat Analysis of a Gasoline Engine. P. F. Walker. Describes a method worked out by the writer. 2000 w. Engr, U S A—April 2, 1906. Serial. 1st part. No. 75890 C.

## Gasoline Motor.

Alternor-Rotative Gasoline Motor. Illustrated description of the new Primat motor. The movement is produced by a set of pistons working alternately in a circular chamber, and the to-and-fro action is transformed to a rotary movement by means of a crank. 900 w. Sci Am Sup—Dec. 2, 1905. No. 73560.

A New Duplex Four-Cycle Gasoline Motor. Illustrated description of the Boudreaux-Verdet motor, a novel design. 1000 w. Sci Am Sup—Aug. 11, 1906. No. 78542.

Notes on Two-Cycle Marine Engines. D. W. Gawn, in *Eng. Mch. and World of Science*. Presenting the advantages of the two-cycle engine for marine work, and giving suggestions for its working. 2200 w. Sci Am Sup—Aug. 4, 1906. No. 78428.

Some Recent Interesting Industrial Applications of the Gasoline Motor. An illustrated article describing unusual applications. A motor-driven sewage-collecting wagon; a wagon for trolley inspection; air compressor motor, etc. 2700 w. Sci Am Sup—June 16, 1906. No. 77288.

The 30-35-H. P. Sinms Petrol Engine. Brief illustrated description of an engine designed for heavy commercial vehicles, such as omnibuses. 400 w. Auto Jour—June 2, 1906. No. 77259 A.

## Gas Power.

Gas Engines and Gas Producers (Gasmaschinen und Kraftgaserzeuger). Otto Hoffmann. With illustrations of pressure and suction gas plants; also several types of two and four cycle gas engines, giving data of operative costs. 3500 w. Elek-



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## Gas Power

trotech u Maschinenbau—Feb. 4, 1906. No. 75145 D.

Gas Engines as Applied to Electric Driving. James Atkinson. Abstract of a paper before the Manchester Soc. of the Inst. of Elec. Engrs. Gives particulars of three sets of engines with suction gas plants showing how economically electric current can be generated when producer gas is used. And gives views of the relative merits and demerits of the various methods of regulating. 3000 w. Elect'n, Lond—Feb. 16, 1906. No. 75277 A.

Electric Power from Blast Furnace Gas. H. Freyn. From a paper read before the W. Soc. of Engrs. Notes the quantity of gas used for the various purposes of the blast furnace plant, showing that a little less than 50 per cent. is available for use outside the plant. Discusses the cost of the electric power station and installation, operation, &c. 4000 w. Ir Age—Dec. 28, 1905. No. 74025.

The Use of Gas for Power and Heating. Ernest A. Dowson. Abstract of a paper read at the Birmingham Assn. of Mech. Engrs. Considers the advantages of gas-engines and plant, describing the properties and manufacture of gases which are economical for industrial use, in the present number. 4000 w. Sci Am Sup—Dec. 9, 1905. Serial. 1st part. No. 73635.

Gas Power. Oskar Nagel. Explains the causes of the progress of the gas engine industry. 2000 w. Elec Chem & Met Ind—June, 1906. No. 77250 C.

Gas Power Economics. F. E. Junge. Enlarged from an address delivered before the Am. Inst. of Elec. Engrs. Discusses methods and facts observed in Europe, comparing gas and steam driven Central Stations, and giving facts of interest to the iron and steel industry. 2800 w. Ir Age—April 26, 1906. Serial 1st part. No. 76312.

Gas Producer Plant for Electric Generating Stations. Wm. J. N. Sowter. Abstract of a paper and discussion before the Dublin Sec. of the Inst. of Elec. Engrs. Briefly considers bituminous producers, suction producers, gas engines, and their working, discussing their economy, etc. 4000 w. Elect'n. Lond—April 6, 1906. No. 76076 A.

Some Features of the Warren Gas Power Plant. J. R. Bibbins. Illustrated description of features in the gas engine equipment of the plant of the Warren & Jamestown Street Railway. 1800 w. Elec Jour—April, 1906. No. 76353.

"10 H. P. for an Hour for One Penny!" Abstracted from *Electrics*. Gives investigations made and a report of

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## Gas Producers

the trials of shops driven by suction gas plant, as compared with electricity. Considers suction gas expensive to install, of doubtful reliability, and troublesome to work. 2300 w. Elec Engr, Lond—March 23, 1906. No. 75897 A.

The Coming Power. E. R. Knowles. Presents information showing the gas engine producer system to be the cheapest in cost of any production known, and discusses its advantages. 2000 w. Elec Rev, N Y—April 21, 1906. No. 76159.

A Naval Gas Engine. M. Joachimson. Illustrated description of a marine engine and producer developed by M. Emil Capitaine, and an account of the methods used in overcoming some of the difficulties encountered. 2200 w. Mach, N Y—July, 1906. No. 77706 C.

Gas Driven Electric Power System. J. R. Bibbins. Illustrated description of such a system as exemplified in the Warren & Jamestown railway plant. 8000 w. Pro Engrs' Soc of W Penn—July, 1906. No. 78247 D.

Gas Power for Marine Work. Godfrey M. S. Tait. An investigation of the gas producer as a fuel generator for this class of work. 1000 w. Int Marine Engng—Aug., 1906. No. 78202 C.

The Municipal Electric Station at Schwerin Mecklenburg (Das Städtische Elektrizitätswerk in Schwerin i. M.). W. Schirmacher. A detailed description of the plant, there being two 330 horse power, two-cycle gas engines of Körting design, with suction producers to drive the dynamos. 3000 w. Elektrotech Zeit-

## Gas Producers.

Gas Producers for Power. Julius Wile. From a paper read before the Technology Club, Syracuse, N. Y. Discusses gas producers and the saving in cost, and presents the advantages of the automatic system as manufactured by the company the author represents. 2500 w. Ir Age—March 8, 1906. No. 75425.

Producer Gas and Gas Producers. Charles H. Day. Discusses the methods employed to produce a suitable and sufficiently cheap gas for power purposes. 2500 w. Power—Feb, 1906. No. 74901 C.

The Gas Producer Power Plant. C. B. Lamont. Examines the results obtained at the testing plant of the St. Louis Exposition, and reviews briefly the development of the gas engine, with the aim of showing its advantage from a purely monetary standpoint, under conditions existing on the Pacific Coast. IIs. 4400 w. Jour of Elec—March, 1906. No. 75468 C.

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## Gas Producers

The Suction Gas Producer. W. H. Booth. An illustrated account of the suction gas producer, its general principle and object, describing types. 3700 w. Cassier's Mag—March, 1906. Serial, 1st part. No. 75611 B.

Gas Producers and Producer Gas. Dr. R. S. Moss. Describes the method of producing the gas, the composition of the coal used, &c., in the present number. 1800 w. Min Wld—Nov. 11, 1905. Serial. 1st part. No. 73118.

Recent Gas Producers (Neuere Kraft-gaserzeuger). R. Schöttler. Illustrating and describing improved types of suction gas-producers for direct connection to gas engines. Serial. Part I. 3500 w. Zeitschr d Ver Deutscher Ing—Nov. 11, 1905. No. 73321 D.

Results of the Preliminary Producer Gas Tests of the United States Geological Survey Coal Testing Plant at St. Louis. R. H. Fernald. An account of the preliminary work. Ills. 2500 w. Trans Am Soc of Mech Engrs (No. 080)—Dec., 1905. No. 73442 C.

Trials of Suction Gas-Producer Plants. Report on the trials under the auspices of the Highland and Agricultural Society of Scotland. 2500 w. Mech Engr—Nov. 11, 1905. No. 73278 A.

Reversed-Combustion Gas Producers (Gazogènes à Combustion Renversée). J. Deschamps. A review of the work of the late M. Lencauchez, with especial reference to the reversed draft producer for generating fuel gas. 7500 w. Mem Soc Ing Civ de France—Oct., 1905. No. 73881 G.

The Gas Producer for Heating Processes. William B. Chapman. Describes the American gas producer and gives some of the applications made of it with marked economy and advantage. 2000 w. Sci Am—Dec. 23, 1905. No. 73983.

The Suction Type of Gas Producer. Abstract of a paper by C. H. Treglown, read before the S. Staffordshire and Warwickshire Inst. of Min. Engrs. Describes the Tangye suction gas plant, discussing factors affecting the working and the advantages. 3000 w. Col Guard—Dec. 15, 1905. No. 74052 A.

Gas Producer for Use with Mineral Oil (Gasogène pour Huiles Minérales). A description of the Lazareff gas producer for the direct conversion of heavy mineral oils into illuminating and fuel gas. 1200 w. Génie Civil—Dec. 16, 1905. No. 74625 D.

Balanced Draft Gas Producer Furnace as Applied to Steam Boilers. Embury

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M'Lean. Abstract of a paper read before the Brooklyn Engrs. Club. Illustrated description. 2000 w. Ir Age—Sept. 13, 1906. No. 79154.

Producer Gas and Its Uses. W. H. Waddingham. Explains this system of gas making and some of its applications, giving the leading types of engines used, etc. 6 plates. 4000 w. Trans N E Coast Inst of Engrs & Shipbldrs—Aug., 1906. No. 79255 D.

## Gas Propulsion.

Gas Engines for Ship Propulsion. J. E. Thornycroft. Read before the Inst. of Naval Archts. Describes the working of a gas-engine in conjunction with a gas producer, considering the possible advantages and some of the difficulties, and gives details of a number of vessels fitted with them, which have shown satisfactory results. Ills. 4000 w. Engng—April 13, 1906. No. 76305 A.

## Gas Turbine.

The Gas Turbine. Some Tests of its Practical Efficiency. C. E. Lucke. Data and results of experiments with compressed air upon a De Laval wheel, showing the improbability of high efficiency. 3000 w. Engineering Magazine—August, 1906. No. 78191 B.

The Question of the Gas Turbine. Robert M. Neilson. With commentary by Henry F. Schmidt. Discusses the probability of making the gas turbine a commercial success, and the difficulties of the problem. 2000 w. Power—Jan., 1906. No. 74127 C.

Notes on Prime Movers with Especial Reference to the Gas Turbine (Généralités sur les Moteurs et Spécialement les Turbines à Gaz). J. Deschamps. An examination of the application of the Carnot cycle to heat engines as in the Diesel motor, showing also the possibility of approximating this result in the gas turbine. 3000 w. Mem Soc Ing Civ de France—Feb., 1906. No. 76236 G.

The Gas Turbine (Les Turbines à Gaz). L. Sekutowicz. An exhaustive study of the theory of the gas turbine, with a discussion of the constructive features, and a review of the experimental work thus far done. 20,000 w. Mem Soc Ing Civ de France—Feb., 1906. No. 76235 G.

The Problem of the Gas-Turbine. Du-gald Clerk. Inaugural address to the Jun. Inst. of Engrs. A critical review of what has been written and attempted in this field, not favorable to expectations of future success. 4500 w. Jour of Gas Lgt—Nov. 7, 1905. No. 73271 A.

## Gas Washing.

The Bianchi Cooling and Washing Ap-

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## Heat Motors

paratus for Blast Furnace Gases (Der Bian sche Reinigungs-und Kühl-apparat für Hochofengase). Fritz Krull. The gases are passed through a drum partly filled with water, and containing revolving perforated discs. 1800 w. Glasers Annalen—March 1, 1906. No. 75724 D.

## Heat Motors.

Notes on the Thermodynamics of Heat Engines (Remarques sur la Thermodynamique des Machines Motrices). M. Jouguet. A theoretical study of the thermodynamics of gas engines and their cycles. 6000 w. Revue de Mécanique—July 31, 1906. No. 79917 E+F.

## Igniters.

Experiments on Gas Engine Igniters. F. W. Springer. Illustrates and describes experiments used in an experimental study of ignition apparatus commonly used in gas engines. 3800 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77515 N.

## Ignition.

Ignition System for Gasoline Motors. Clarence B. Brokaw. From a lecture delivered before the Auto Club of America. Considers the make-and-break system, and the jump spark. 6000 w. Automobile—April 19, 1906. No. 76148.

Gas Engine Ignition. Remarks on the make-and-break method, and the jump spark method of electric ignition. 1200 w. Sci Am Sup—Aug. 18, 1906. No. 78624.

The Rankin Kennedy System of Magneto Ignition. Illustrated description of a magneto ignition system for internal combustion engines in which the spark is obtained in the cylinder by means of a high-speed magneto machine working in conjunction with a trembler coil. 700 w. Engng—Feb. 16, 1906. No. 75285 A.

Apparatus for Ignition on Petrol Engines. Donald S. Munro. Brief review of the various arrangements for electric ignition, both of high and low-tension systems. Ills. 4500 w. Prac Engr—Oct. 19, 1906. No. 80127 A.

## Marine Motors.

Internal-Combustion Motors for Marine Service (Motori Marini a Combustione Interna). D. Cardile. A comparative review of the applicability of various types of motors to vessels, with especial reference to the Diesel Marine motor. 5000 w. Rivista Marittima—Jan., 1906. No. 75790 G.

The Application of Combustion Motors for the Propulsion of War Ships (Zür Frage der Verwendbarkeit von Verbrennungsmotoren für die Fortbeweg-

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ung von Kriegsschiffe). Emil Capitaine. An examination of the relative weights and radius of action for steam engines, Diesel motors and Capitaine motors. Two articles. 7000 w. Schiffbau—March 14, 28, 1906. No. 75761 each D.

The Parsons Marine Motor. Illustrates and describes an internal combustion engine, specially designed for Marine work. It uses either petrol, paraffin, or alcohol as a fuel. 2000 w. Autocar—March 3, 1906. No. 75494 A.

## Motor Testing.

See Mechanical Engineering, Measurement.

## Oil Engine.

Oil Engine Working with Crude Oil. Illustrates and describes an engine made in England and previously described which has been adapted to the use of crude oil. 600 w. Engng—March 2, 1906. No. 75507 A.

The Effect of Water Injection on Crude-Oil Engines. Robert F. McKay. Discusses the advantages and disadvantages of water injection. 1000 w. Engng—May 25, 1906. No. 77140 A.

Notes on Some Oil Engine Tests. Reports a series of tests made on an oil-engine driving, through an intermediary belt, a continuous-current dynamo in order to determine the behavior and efficiency of the engine at various loads. 1700 w. Elec Engr, Lond—Aug. 31, 1906. No. 79125 A.

The 50-Horse-Power Four-Cylinder Crossley Vertical Oil Engine with New System of Governing. Illustration with description of the new system of governing by auxiliary air. 600 w. Sci Am Sup—Oct. 20, 1906. No. 79872.

## Packing.

An Improved Method of Packing the Cylinder Head of a Gasoline Engine. From the *English Mechanic and World of Science*. Directions for successful packing are given. 700 w. Sci Am Sup—Dec. 2, 1905. No. 73556.

## Patents.

See Industrial Economy.

## Petrol Motor.

140-Horse-Power Wolseley Petrol-Motor. Illustrated description of one of the largest petrol-motors yet constructed for industrial use. Built for the General Electric Co., U. S. A., for railway traction. 2400 w. Engng—Nov. 10, 1905. No. 73288 A.

## Poppet Valves.

The Pressure Drop Through Poppet

# MECHANICAL ENGINEERING

## Power Plants

Valves. Charles Edward Lucke. A report of tests made to determine the relation between pressure drop through a poppet valve and the condition of flow, form of opening, &c., that give rise to the pressure drop observed. Ills. 2800 w. Trans Am Soc of Mech Engrs, No. 084—Dec., 1905. No. 73499 D.

## Power Plants.

Modern Gas Engine Power Plants. Franz Koester. Gives illustrations of a number of large plants, with a brief review of the development of the gas engine. 1800 w. Eng Rec—Jan. 6, 1906. No. 74276.

## Pressures

Experiments on Explosive Mixtures of Illuminating Gas and Air (Untersuchungen Explosibler. Leucht-gas-Luftgemische). F. Hausser. A detailed account of the investigation of pressures and associated phenomena caused by the ignition of various explosive gas mixtures in a closed chamber. 4500 w. Zeitschr d Ver Deutscher Ing—Feb. 17, 1906. No. 75701 D.

The Pressure of Explosives. Experiments on Solid and Gaseous Explosives. J. E. Petavel. From Phil. Trans. of the Roy. Soc. of London. An illustrated article giving detailed description of methods and of apparatus used. 3800 w. Sci Am Sup—March 24, 1906. Serial, 1st part. No. 75638.

## Producer Gas.

Trials of Producer Gas Plants. R. E. Mathot. Calls attention to the manner the coal consumed in the generator should be measured, reporting tests made on producer-gas engines. 1200 w. Power—May, 1906. No. 76366 C.

Producer Gas and Gas Producers. Samuel S. Wyer. Read before the Illinois Clay-Workers' Assn. Considers the constituents of producer gas and gives illustrated descriptions of types of gas producers. 1600 w. Brick—June 1, 1906. No. 77161.

Producer Gas Power. Julius Wile. Considers reasons for the popularity of producer gas, its efficiency, etc. Ills. 1000 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77513 N.

Gas Producers for Power Purposes Oskar Nagel. Briefly refers to the Dawson, and Mond processes, and gives an illustrated description of a modern producer made by Ernest Koerting, and gives information relating to such plants. 1500 w. Eng News—May 17, 1906. No. 76679.

The Production of Power Gas from

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## Starting

Lignite (Die Vergasung der Braunkohle zu Motorische Zwecken). H. Neumann. A discussion of various forms of gas producers, purifiers, and auxiliary apparatus for the generation of power gas from lignites and brown coals. Serial. Part I. Zeitschr d Ver Deutscher Ing—May 12, 1906. No. 76816 D.

The Use of Producer Gas for Power Generation. Godfrey M. S. Tait. Shows that the variable element in producer gas is due to the continually changing volume of the hydrogen constituent, and describes the Combustion Utilities Co.'s process for the regulation of flame and combustion temperatures, giving results obtained. 2200 w. Eng Rec—May 19, 1906. No. 76735.

## Producers.

Experimental Studies with a Gas Producer (Untersuchungen an Gaserzeugern). Karl Wendt. Data and results of tests upon the chemical and thermal reactions in the fuel-gas producer; with tables and diagrams. 4000 w. Stahl u Eisen—Oct. 1, 1906. No. 79942 D.

Producer Gas for Power and Fuel. Julius I. Wile. Explains the production of this gas, discussing its uses, and the apparatus required, types of engines and related matters. 2800 w. Ir Age—Oct. 13, 1906. No. 79825.

## Reciprocating Cylinder.

James' 4-Cycle Combustion Engine with Reciprocating Cylinder. Illustrations, showing an arrangement patented by T. S. James, the object being to secure more successful expulsion of the products of combustion during the exhaust stroke. 500 w. Mech Engr—Sept. 15, 1906. No. 79441 A.

## Roche.

The Roche Motor. Illustrated description of a motor of the four-cycle type which utilizes the heat of the explosion, before expansion occurs, to raise the temperature of a gas and cause it to do work by its expansion. 1800 w. Sci Am Sup—Aug. 25, 1906. No. 78698.

## Safety Factor.

The Choice of a Factor of Safety for a Machine Member. Forrest E. Cardullo. A discussion of the apparent factor of safety, and the factors which compose it, outlining the method of development, and illustrating by examples. 3300 w. Mach, N Y—Jan., 1906. No. 74114 C.

See also Mechanical Engineering, Automobiles.

## Starting.

On Some Methods for Starting Explosion Engines. E. Butler. Briefly de-

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## Suction Gas

scribes eight methods used and describes experiments made by the writer, giving diagrams. 4000 w. *Mech Engr*—June 2, 1906. Serial. 1st part. No. 77262 A.

## Suction Gas.

Suction Gas Producers. Oskar Nagel. An explanation of this system of gas-producer plants. 1200 w. *Eng & Min Jour*—June 9, 1906. No. 77196.

Suction Gas Producer Trials. The first of a series of articles giving an account of the trials of suction gas plants at the Royal Agricultural Society's Show. Ills. 1600 w. *Engr, Lond*—June 15, 1906. Serial. 1st part. No. 77482 A.

Developments in the Construction of Suction Gas-Producers. William A. Tookey. Abstract of a paper before the Jr. Inst. of Engrs., with editorial. Showing the stage to which design has arrived as the result of experience. 7000 w. *Jour of Gas Lgt*—April 24, 1906. No. 76533 A.

Suction Gas Producer Plant at Wichita, Kan. Illustrated detailed description of a plant for electric driving of motors, elevator service, and lighting in a factory. 1800 w. *Engr, U S A*—July 16, 1906. No. 77995 C.

Suction Gas Producers for Tarry Fuels (Sauggaserzeuger für Teerbildende Brennstoffe). C. Diegel. Illustrating especially the Pintsch producer, in which the gas is drawn off from the middle of the fuel bed. 2000 w. *Stahl u Eisen*—July 1, 1906. No. 78148 D.

Suction-Gas Plants. W. E. Dalby. Read before the British Assn. Diagrams and description of a suction-gas plant and its working. 4000 w. *Engng*—Aug. 10, 1906. No. 78676 A.

Cost of Suction Gas Power. Considers things that must have a place in determining the actual cost of generation and maintenance. 3000 w. *Elec Rev, Lond*—Sept. 21, 1906. No. 79577 A.

A Successful Suction Gas Producer Central Station Plant. An illustrated description of a plant at Newton, N. J., which furnishes current for lighting and power for a town of 5,000 inhabitants. 2000 w. *Power*—Dec., 1905. No. 73710 C.

Suction-Gas Producers. Prof. A. Humboldt Sexton. Illustrates and describes four forms of suction gas producers, explaining the principles on which suction producers are based. 3800 w. *Mech Engr*—Dec. 9, 1905. No. 73798 A.

The Davey-Paxman Suction-Gas Plant and Gas Engine. Illustrated detailed description. 2200 w. *Engng*—Nov. 24, 1905. No. 73600 A.

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## Valve Gear

The Thompson-Burger Gas Producer and Engine. Illustrated description of this automatic cut-off gas engine and the suction gas producer. 2000 w. *Ir Age*—Dec. 21, 1905. No. 73940.

## Testing.

Study of a Gasoline Engine Test. P. F. Walker. Describes investigations made by students for graduating theses, stating the object of the tests, describing apparatus and methods used, and discussing results. Ills. 4500 w. *Engr, U S A*—Dec. 15, 1905. No. 73788 C.

Testing High Power Modern Gas Engines. William H. Spiller. Read before the Tech. Soc. of Kansas City, Mo. An account of the severe test in the factory which the modern gas engine has to undergo. 1300 w. *Min Wld*—Dec. 23, 1905. No. 74006.

## Turbines.

The Gas Turbine (Les Turbines à Gaz). A. Berthier. A general description of the present status of the gas turbine question, with reference to the turbines of Stolze and of Armengaud and Lemale. 2500 w. *Génie Civil*—Dec. 2, 1905. No. 73814 D.

## Two-Cycle.

Development of the Two-Cycle Gas Engine. C. P. Malcolm. A brief history of the development, pointing out the problems that have proved difficult. 3000 w. *Automobile*—Oct. 25, 1906. Serial. 1st part. No. 80083.

Wolseley 2-Cycle Internal Combustion Engine. Illustrated description of a design aiming principally at economical working. 1500 w. *Mech Engr*—Oct. 13, 1906. No. 80039 A.

See also Marine and Naval Engineering.

See also Mechanical Engineering, Automobiles.

## Valves.

Gas Engine Valve Construction. H. S. Brown. Considers in detail the requirements of each section of an inlet or exhaust valve for gas, gasoline, or oil engines, and their design and construction. Ills. 1200 w. *Ir Age*—July 19, 1906. No. 78013.

Functions of Valves in Four-Cycle Motors. Shows the arrangement and operation of the inlet and exhaust valves of a modern four-cycle gasoline motor. Ills. 2200 w. *Automobile*—April 19, 1906. No. 76147.

## Valve Gear.

Thornycroft's Valve Gear for Reversible Explosion Engines. Illustrated de-

## MECHANICAL ENGINEERING

### Vaporizer

scription of an arrangement of valve operating mechanism suitable for use with 4-cycle reversible internal-combustion engines. 1000 w. Mech Engr—July 21, 1906. No. 78304 A.

### Vaporizer.

Gardner's Vaporizer for Oil Engines. Illustrated detailed description. 900 w. Mech Engr—April 28, 1906. No. 76559 A.

### HEATING AND COOLING

### Depot

The Westmacott Paraffin Vaporiser. Illustrated description of a vaporiser whereby ordinary lamp oil can be substituted for petrol with internal combustion engines, particularly for marine motors. 900 w. Auto Jour—Feb. 24, 1906. No. 75362 A.

See also Mechanical Engineering, Automobiles.

## HEATING AND COOLING

### Air Analysis.

Air Analysis as an Aid to the Ventilating Engineer. J. Roger Preston. Prize paper. Aims to show tests of importance to ventilating engineers, giving details and drawings of apparatus. Ills. 4000 w. Heat & Vent Mag—Oct., 1906. No. 80009.

### Atmospheric Regulation.

Artificial Regulation of Atmospheric Humidity and Temperature. Illustrated description of a machine designed to regulate artificially the ratio between the temperature and the humidity by passing water over a large cooling surface, over which, at the same time, large volumes of air are being drawn. 2000 w. Sci Am—June 23, 1906. No. 77418.

### Auditorium.

Heating and Ventilating the Main Auditorium of the Broadway Tabernacle, New York. C. Terau. Describes the conditions, and the installation of a blast system, with mechanical exhaust and automatic temperature control. 1600 w. Am Soc of Heat & Vent Engrs—Jan., 1906. No. 74337 C.

### Bank Heating.

Heating and Ventilating the National Park Bank, New York. Illustrated description of a system of direct radiation, with auxiliary indirect apparatus for ventilating, used in a T-shaped building. 1000 w. Heat & Vent Mag—May, 1906. No. 76700.

### Boilers.

Elements of Commercial Value in Household Boilers. J. M. W. Kitchen. Discusses the desirable requirements in a household water or steam heater. 2000 w. Met Work—Dec. 9, 1905. No. 73611.

### Central Plant.

Reconstructing a Central Power and Heating Plant. Describes the reconstruction of a plant at Garden City, Long Island, supplying a cathedral, two school buildings, and other buildings, with the object of saving fuel. Ills. 2000 w. Heat & Vent Mag—March, 1906. No. 75623.

A Central Steam Heating and Power Plant. W. N. Zurfluh. Illustrated description of the plant in Springfield, Ohio. 3000 w. Engr, U S A—June 15, 1906. No. 77368 C.

### Churches.

Church Sanitation. William Paul Gerhard. A discussion of church hygiene, and also the design, materials, and various matters relating to these buildings. Heating and ventilation are especially considered. 3300 w. Am Archt—May 26, 1906. No. 76961.

### Church Heating.

The Heating Plant of Calvary Church, Pittsburg. H. S. Knowlton. Illustrated detailed description of the plant for heating one of the largest churches and parish house in Pennsylvania. Both direct and indirect systems are used. 3000 w. Eng Rec—Aug. 10, 1906. No. 78644.

### City Hall.

Low Pressure Heating and Ventilating Plant at the New City Hall at Frankfurt-on-the-Main (Die Niederdruckdampfheizungs und Lüftungsanlagen im Neuen Rathause zu Frankfurt a. M.). With plans and sections of the buildings showing the arrangement of the radiators and the ventilating ducts. 1800 w. 2 plates. Gesundheits-Ingenieur—March 24, 1906. No. 76839 D.

### Custom House.

Heating and Ventilating System of the New Custom House in New York. A seven-story granite and steel building in which the indirect heating system is used, except in a portion to be devoted to Post-Office purposes, where auxiliary direct radiation is installed. Ills. 5000 w. Eng Rec—May 26, 1906. No. 76959.

### Depot.

Heating and Ventilating System of the Louisville & Nashville Depot, Louisville, Ky. Richard C. Williams. Illustrated description of an indirect system recently completed, of interest because of the installation of an air washer. 1000 w. Eng News—Aug. 23, 1906. No. 78693.

# MECHANICAL ENGINEERING

## Dormitories

### Dormitories.

Some Data Relating to the Heating of the Edgar F. Smith House Dormitories, University, Pennsylvania. H. W. Spangler. The University Dormitories are a group of 21 buildings under a common roof. Describes a direct radiation system of steam heating. 2500 w. Jour Fr Inst—March, 1906. No. 75558 D.

### Drying.

Notes on Drying Plants (Einiges über Trockenanlagen). Karl Reyscher. A discussion of the best method of arranging the air circulation in the design of drying kilns. 3000 w. Zeitschr d Ver Deutscher Ing—Dec. 23, 1905. No. 74602 D.

### Dwellings.

Unwholesome Air in Dwellings. Albert Levy, in *La Technique Sanitaire*. Translation. Defective heating and lighting apparatus shown to be responsible for much of the bad air. 1600 w. Heat & Vent Mag—March, 1906. No. 75625.

### Economy.

Economy in Household Heating (Die Oekonomie der Häuslichen Heizung). Dr. E. J. Constam. Discussing especially the various stoves and heaters adapted for household use in Switzerland. 3500 w. Schweiz Bauzeitung—March 17, 1906. No. 76248 B.

### Exhaust.

The Theory of Heating with Exhaust Steam (Zur Theorie der Abdampfheizung). Dr. B. Biegeleisen. A comparison of the relative efficiencies of exhaust steam-heating and the condensation of exhaust steam for power production. 5000 w. Gesundheits-Ingenieur—March 31, 1906. No. 76840 D.

### Exhaust Heating.

The Commercial Utility of Long-Distance Heating with Exhaust Steam (Die Wirtschaftlichkeit der Abdampf-Fernheizung). B. Biegeleisen. A study of the use of exhaust steam from central power plants for heating adjacent buildings, with computations as to the economy. Two articles. 7500 w. Gesundheits-Ingenieur—July 14, Aug. 4, 1906. No. 78729, each B.

### Exhaust Steam.

Exhaust Steam for Heating Buildings. An illustrated discussion of systems which utilize steam for heating, the piping systems, &c. 2200 w. Engr, U S A—Jan. 1, 1906. Special No. No. 74324 D.

A Distillery Power and Heating Equipment. Illustrated description of a plant in Baltimore, Md., which heats, by means

## HEATING AND COOLING

## Heat Insulation

of its exhaust steam, no less than 16 detached buildings. 800 w. Heat & Vent Mag—April, 1906. No. 76357.

### Fans.

Theory and Computations for Propeller Fans (Theorie und Berechnung der Schraubenventilatoren). Dr. H. Lorenz. A mathematical examination of the principles and proportions of disc ventilating fans, with working formulas and tables. 3000 w. Zeitschr f d Gesamte Turbinenwesen—Aug. 10, 1906. No. 79302 D.

### Fan System.

A Fan System of Furnace Heating. Illustrated description of a heating and ventilating system for an eight-room school in Summit, N. J. 2000 w. Met Work—March 24, 1906. No. 75646.

### Franklin.

Benjamin Franklin, the First American Heating and Ventilating Engineer. Albert A. Cary. Address before the Am. Soc. of Heat. & Vent. Engrs. Considers Franklin's Pennsylvania fireplace, and his theory of heat, with his views concerning the prospects of obtaining coal for fuel in the United States. 3800 w. Eng Rec—Jan. 27, 1906. No. 74767.

### Gas Heating.

A Fan Heating System with Gas Heater. Illustrated description of the methods used in heating an engine-house at Parsons, Kansas. The equipment consists of a multi-tubular gas heater, a hot-blast heating fan, and an induced-draft fan for control of the furnace draft. 1600 w. Eng Rec—Oct. 6, 1906. No. 79670.

### Heat-Economy.

Heat-Economy in Factories. Henry Alexander Mavor. A study of the conditions of heat-production and utilization in factories. Also discussion. 9500 w. Inst of Civ Engrs—No. 3561. No. 79522 N.

### Heating.

Electric Heating. Abstract of a paper by James I. Ayer, presented to the Nat. Elec. Lgt. Assn. Suggests ways of introducing electric heating into homes, and some of the useful applications. 2000 w. Elec Wld—Sept. 1, 1906. No. 78980.

### Heat Insulation.

Heat Insulation; Its Principles as Related to Cold Storage Practice. J. B. d'Homergue. Treats of insulation as bearing directly on artificial refrigeration, the materials used; with report of tests carried out at Purdue University, the apparatus and methods employed, &c. Discussion. Ills. 9000 w. Pro Engrs' Soc of W Penn—Jan., 1906. No. 74543 D.

# MECHANICAL ENGINEERING

## Heat Losses

### Heat Losses.

Calorimetric Methods of Determining the Loss of Heat from Buildings and Radiators. A. H. Barker. Read before the Inst. of Heat and Vent. Engrs (England). Suggests methods which the writer considers more reliable than most methods in use. 4500 w. Plumb & Dec—Feb. 1, 1906. No. 74980 A.

### Heating Surface.

Determination to Heating Surface. Review of a paper by J. Nelson Russell, before the Brit. Inst. of Heat. & Ven. Engrs., explaining the writer's method of determining the amount of heating surface needed in heating and ventilating work. 2200 w. Met Work—Nov. 11, 1905. No. 73066.

### Heat Units.

The Heat Unit and Its Application to the Heating of Buildings. George G. Bennett. Read before the Ohio Soc. of Mech., Elec., and Steam Engrs. Gives method of finding the loss of heat units, illustrating by example. 800 w. Engr, U S A—Dec. 1, 1905. No. 73620 C.

### Hospital.

Heating and Ventilating a Hospital. Illustrated description of the combination of direct and indirect steam heating installed in St. Luke's Hospital, Utica, N. Y. 2000 w. Met Work—June 2, 1906. No. 77063.

The Warming and Ventilation of Hospitals. Charles L. Hubbard. Suggestions for successful and safe heating of this class of buildings. 3000 w. Eng Rec—Oct. 13, 1906. No. 79785.

### Hospital Heating.

Heating and Ventilation of St. Paul's Hospital, Montreal, Que. Alan G. McAvity. Describes the system installed, outlining the ideal aimed at, and discussing the efficiency of the installation. Ills. 3000 w. Can Soc of Civ Engrs—Jan. 18, 1906. No. 74763 D.

### Hot Air.

A Notable Departure in Furnace Heating. Illustrated description of a system introducing round risers. 2200 w. Met Work—Nov. 4, 1905. No. 72982.

An Improved Application of Hot-Air Heating. A. O. Jones. Brief description of this system with an improved type of side-wall register for first floor rooms. Ills. 800 w. Heat & Vent Mag—July, 1905. No. 78242.

Fads and Fallacies in Hot-Air Heating. R. S. Thompson. Gives examples illustrating the wrong ideas held by many people in regard to the heating of build-

## HEATING AND COOLING

## Hot Water

ings. 4500 w. Heat & Vent Mag—July, 1906. No. 78240.

### Hotel Plant.

Some Features of the Heating and Ventilating System of the Bellevue-Stratford Hotel, Philadelphia. William G. Snow. Exhaust steam is used for heating. The distributing system is described, and other features of interest. 3500 w. Am Soc of Heat & Vent Engrs—Jan., 1906. No. 74339 C.

Heating and Ventilating Plant of the Hotel St. Regis, N. Y. Describes the plant of an 18-story apartment and transient hotel of the most luxurious design and equipment. Indirect steam heating is used for all portions except the servants dormitory on the top floor, where direct radiation is used. Ills. 4000 w. Eng Rec—Aug. 25, 1906. No. 78811.

### Hot Water.

Calculations and Requirements for Central-Station Heating. Discussing the Schott system for heating circulating water by exhaust steam, the hot water being distributed by circulating pumps. Ills. 2500 w. Elec Rev, N. Y.—March 24, 1906. No. 75666.

Hot Water Heating in a New York Apartment House. Illustrates and describes a gravity circulation hot-water radiation in a ten-story building. 2800 w. Met Work—April 21, 1906. No. 76141.

Computations for Hot Water Heating (Berechnung von Heisswasserheizungen). A. Goebel. With very complete tables and diagrams for determining the proportions of a hot-water system for a required heating capacity. 7500 w. Gesundheits-Ingenieur—June 2, 1906. No. 77638 B.

Construction and Application of the Brückner Heating System (Die Konstruktiven Grundlagen und die Praktische Ausgestaltung der Brücknerheizung). W. Brückner. Describing a hot-water heating system in which the circulation is accelerated by the action of steam in the main riser. 3500 w. Gesundheits-Ingenieur—June 2, 1906. No. 77636 B.

The Determination of the Emission of Heat from Hot-Water Apparatus (Zur Regelung der Wärmeabgabe bei Warmwasserheizung). G. de Grahl. With curves and tables derived from the formula of Rietschel for computing the emission of heat from radiators for various temperature differences. 2000 w. Gesundheits Ingenieur—May 19, 1906. No. 77634 B.

The Theory of the Accelerated Circulation System of Hot-Water Heating (Zur



# MECHANICAL ENGINEERING

## Hot Water

Theorie des Schnellumlauf-Warmwasser-heizung). Dr. Fritz Hasenöhl. An examination of the action of steam in the main riser in accelerating the circulation in a hot-water heating system. 3000 w. Gesundheits-Ingenieur—June 2, 1906. No. 77637 B.

An Interesting Heating Plant. A. T. Hoyt. Illustrated description of a hot water plant which heats four greenhouses and a residence successfully. 2300 w. Dom Engng—July 14, 1906. No. 77941.

The Elimination of Redundant Parts in the Forced Circulation of Hot Water. A. H. Barker. Read before the Am. Soc. of Heat. & Vent. Engrs. Illustrated description of a system which dispenses with the calorifier tube, its traps and valves, and the redundant parts of the pump. 4500 w. Dom Engng—July 21, 1906. No. 78083.

Hot Water Supplies to Towns. Thomas Parker. Remarks on methods of distribution, describing the network of the town of Muttubura, in Queensland, where an improved method has been introduced. 1000 w. Sci Am—Sept. 15, 1906. No. 79175.

The Brueckner System of Hot-Water Heating. Shows this system as applied to a two-pipe radiator installation, to a single-pipe radiator installation, and to an installation where the heating boiler must be located considerably above the level of some of the radiation. Ills. 2000 w. Met Work—Sept. 29, 1906. No. 79537.

## Ice-Plants.

Economy of Combination Compression—and Absorption—Plate Ice-Plants. Henry Torrence. Read before the Am. Soc. of Refrig. Engrs. Gives a comparison of the compression and absorption-systems showing that economy is gained by combining the two. 1400 w. Stevens

## Incrustation.

Hot Water Supply by Indirect Heating.—A Remedy for Incrustation Difficulties. George Chasser. Read before the Brit. Inst. of Heat. & Vent. Engrs. Discusses difficulties due to hard water, and the remedy. Diagrams. 5000 w. Plumb & Dec—Nov., 1905. No. 73121 A. Ind—Jan., 1906. No. 75535 D.

## Library.

Heating and Ventilating Equipment of the Carnegie Branch Library, No. 1, St. Louis, Mo. Illustrated description of a plant in which the air supplied is washed before its delivery to the rooms. 1400 w. Eng Rec—Sept. 1, 1906. No. 78928.

## Post Office.

Heating and Ventilating Plant of the

## HEATING AND COOLING

## Refrigeration

Indianapolis Post Office and Custom House. Plans and description of a plant for a 4-story building built upon three sides of a hollow square, and occupying an entire city block. Both direct and indirect radiation are used. 5200 w. Eng Rec—June 9, 1906. No. 77235.

## Radiation.

Heat Losses and Heat Transmission. Walter Jones. Read at meeting of the Am. Soc. of Heat. & Vent. Engrs. Discusses methods of calculation for ascertaining what radiator, or pipe surface for hot water, will be required to give a desired temperature. 4500 w. Met Work—July 21, 1906. No. 78049.

Radiation from Extended Ribbed Surfaces in Steam Heaters (Wärmeabgabe der Rippenheizflächen bei Dampfheizkörpern). E. Ritt. A review of Rietschel's formula, discussing the heat units given off for a given temperature difference. 1000 w. Gesundheits-Ingenieur—July 7, 1906. No. 78157 B.

Wall Radiators vs. Long Pipe Coils. J. A. Donnelly. Considers the use of wall radiators in the place of pipe coils for heating buildings in which long coils are usually employed. 900 w. Heat & Vent Mag—July, 1906. No. 78241.

## Radiator.

The Kaerle Low-Pressure Radiator (Kaerle's Patent Niederdruckdampf Heizkörper). Describing an arrangement of injector nozzle by which the movement of the incoming steam effects a positive circulation in the radiator. 1500 w. Gesundheits-Ingenieur—April 28, 1906. No. 76841 D.

## Refrigeration.

Scale. Arthur Pennell. Cause of formation of scale in ice making and refrigerating plants and method of prevention or of minimizing losses from this cause. 1500 w. Ice & Refrig—Nov., 1905. No. 73046 C.

The Relation of the Central Station to the Motor-Driven Refrigerating Machine. G. W. Goddard. Abstract of a paper read at meeting of the Edison Ill. Cos. Explains the system of the present refrigeration compression machine, and its many applications, showing the advantages of motor-driving. 1600 w. Elec Rev, N Y—Nov. 11, 1905. No. 73112.

Pipe Line Refrigeration. J. E. Starr. Address before the Am. Soc. of Refrig. Engrs. Reviews the work done in pipe line distribution, both those using brine circulation and those using direct expansion, the problems in connection with such systems and the progress made in solv-

# MECHANICAL ENGINEERING

## Refrigeration

ing them. 2500 w. Eng News—Dec. 14, 1905. No. 73734.

1,000 Horse Power Refrigerating Machine (1,000 Pferdiges Kältemaschine). G. Döring. A description of the Boyle machine at the Quincy Market cold storage warehouse in Boston. 1800 w. Zeitschr d Ver Deutscher Ing—Dec. 2, 1905. No. 73806 D.

Needed Improvements in the Transportation of Perishable Fruits: A Refrigeration Problem. Extracts from a paper by G. H. Powell. Discusses the difficulties of distribution in the fruit trade. 1600 w. Eng News—Jan. 4, 1906. No. 74176.

Rise of Temperature in Cold Stores. Reviews an article by M. Desvignes, in *L'Industrie Frigorifique*, comparing different methods employed in France for the refrigeration of insulated stores, and giving an analysis of the laws governing the loss of cold which takes place. 2000 w. Engr, Lond—March 19, 1906. No. 75604 A.

Mechanical Refrigeration and Its Future Development. Jos. H. Hart. A thermodynamic study of the principles of mechanical refrigeration, considering the steam engine as a reverse prototype of the compressor. 3500 w. Engineering Magazine—May, 1906. No. 76277 B.

Management of an Absorption System. W. S. Luckenbach. Suggestions for difficulties that may arise, and for the operation of the plant. 1500 w. Engr, U S A—June 15, 1906. No. 77369 C.

Cold Storage on Board Ship. Sydney F. Walker. The first of a series of articles discussing the problems in connection with cold storage on ships. Ills. 3500 w. Int Marine Engr—July, 1906. Serial. 1st part. No. 77453 C.

Speed of Ammonia Compressors. R. L. Shipman. Some observations in regard to results of high speed of ammonia compressors, a report of tests made, and conclusions. Ills. 4000 w. Ice & Refrig—June, 1906. No. 77100 C.

Refrigerator Design. Charles E. Edgar. Calls attention to faults in the usual arrangement of evaporating coils, and gives suggestions. Ill. 3000 w. Ice & Refrig—July, 1906. No. 77763 C.

Refrigeration System of the Model New Abattoir in New York City. Illustrated description of the provisions for cold storage, and a refrigerating plant designed especially for the preservation of dressed meats. 4000 w. Eng Rec—July 14, 1906. No. 77937.

Some Faults in Ice Machines. William Nottberg. Points out bad features of the

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present ice machines and accessories. 2000 w. Ice & Refrig—July, 1906. No. 77762 C.

The Commercial Importance of Refrigerating Processes (Wirtschaftliche Wirkungen der Kältetechnik). Hr. v. Linde. A review of the development of refrigerating machinery in the last 25 years, showing its great commercial importance in breweries, slaughter houses, storage warehouses, etc. 3000 w. Zeitschr d Ver Deutscher Ing—June 30, 1906. No. 78109 D.

Different States of Ammonia in Refrigeration. Dr. J. E. Siebel. Shows the importance of the different states of ammonia, discussing boiling ammonia, wet ammonia, and saturated ammonia, efficiency obtainable, etc. 3000 w. Ice & Refrig—Oct., 1906. No. 79607 C.

Department Store Refrigeration. Illustrates and describes refrigerating plants in Chicago department stores. 1500 w. Ice & Refrig—Feb., 1906. No. 74848 C.

Refrigeration with Electric Motive Power. Dr. Alfred Gradenwitz. Illustrated, with description of the arrangement and operation of the apparatus, showing that refrigeration is available wherever electric current can be obtained. 1100 w. Sci Am—Feb. 3, 1906. No. 74812.

The Electrical Driving of Cold Storage and Ice-Making Plants. Sydney F. Walker. Considers the application of electricity to this work, the properties of different refrigerating agents, etc. 5400 w. Elec Rev, N Y—Feb. 17, 1906. No. 75034.

## Residence.

Heating and Ventilating a Country Residence. Gives plans and brief description of an indirect system of steam heating, combined with a direct, for a Long Island home. 800 w. Heat & Vent Mag—Oct., 1906. No. 80010.

## Return Pipes.

Sizes of Return Pipes in Steam Heating Apparatus. Jas. A. Donnelly. Considers the functions of return pipes and methods of proportioning. 3000 w. Am Soc of Heat & Vent Engrs—Jan., 1906. No. 74334 C.

## Roundhouse.

Gas Burning Heater with Fan System for Roundhouse. Illustrates and describes a modern and novel method adopted at Parsons, Kansas, for heating with natural gas. 1800 w. Ry Mas Mech—Sept., 1906. No. 79026.

## Schoolhouses.

Schoolhouse Warming and Ventilation. Charles L. Hubbard. An actual installation of an indirect gravity steam heating system is discussed and illustrated. 2000

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## Schoolhouses

w. Met Work—Jan. 6, 1906. Serial. 1st part. No. 74186.

Warming and Ventilating a Schoolhouse at Pelham, N. Y. C. T. Richards. Illustrated description of a gravity system of furnace heating in a four-room building. 1700 w. Met Work—Jan. 13, 1906. No. 74328.

The Schoolhouse—Its Heating and Ventilation. Joseph A. Moore. Presents method proved by experience to give satisfactory results. Favors the downward system of ventilation. 2000 w. Heat & Vent Mag—April, 1906. Serial. 1st part. No. 76359.

Heating and Ventilating Schoolhouses. Charles L. Hubbard. Gives statements based on many years experience in this line of work, which may be easily adapted to most buildings. 700 w. Eng Rec—Oct. 6, 1906. No. 79672.

Heating and Ventilating a medium-Sized School Building. Gives an illustrated description of the heating and ventilating system used in Public School 132, in the Bronx, New York City. 1000 w. Heat & Vent Mag—Nov., 1905. No. 73263.

The Progress of American Schools in Regard to Health Laws. J. D. Sutcliffe. Read at meeting of the Inst. of Heat. & Vent. Engrs., London. Discusses the heating, ventilation, sanitation and fire appliances from an English engineer's point of view. 3000 w. Heat & Vent Mag—Nov., 1905. No. 73265.

The Heating and Ventilation of the New Tacoma High School. Briefly describes the building showing the difficulties to be met in heating, and illustrates and describes the system of direct and indirect radiation, operated by exhaust steam with the Webster vacuum system of steam circulation and Johnson pneumatic heat regulating apparatus. 4000 w. Eng Rec—May 5, 1906. No. 76524.

Comparison of Heating and Ventilating Plants Installed in Chicago Public School Buildings at Various Periods. An analysis of the cost of installation, fuel consumption, maintenance and efficiency. 1200 w. Eng & Min Jour—June 16, 1906. No. 77346.

Heating and Ventilating a Modern School Building. C. Dix McArthur. Describes a school of medium size, No. 42, the Bronx, New York City, which presents a good example of a high pressure system; ventilating by steam engine driven blowers and heating with exhaust steam. Ills. 1800 w. Dom Engng—June 16, 1906. No. 77334.

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## Steam Heating

Heating a School Building by a Warm Air Furnace. Plans and explanation, submitted by T. J. Grier for a design to meet the requirements of compulsory ventilation. Ills. 2000 w. Met Work—June 9, 1906. No. 77160.

Mechanical Equipment of the New Stuyvesant High School, New York City. C. Dix McArthur. Plans and description of a manual training high school, where the equipment has been selected not only to serve the purpose intended, but to educate students and to make tests in connection with laboratory work. Ills. 4000 w. Heat & Vent Mag—Oct., 1906. No. 80008.

## Shops.

Heating and Ventilating Plant for the Shops of the Southern R. R. at Spencer, N. C. Describes an indirect steam heating system with fan blowers installed in a large new shop. Ills. 1000 w. Eng Rec—Sept. 8, 1906. No. 79035.

## Steam Heating.

Sketch Details of Heating Installations. Frank G. McCann. Gives special sketch details prepared for use of New York City Board of Education. 1200 w. Heat & Vent Mag—Nov., 1905. No. 73262.

Steam Heating of Classrooms on a Recreation Pier in New York City. Illustrated description of an unusual installation made necessary by the need of temporary school accommodations. 2500 w. Met Work—Nov. 4, 1905. No. 72984.

A New Vapor-Vacuum System of Steam Heating. Jas. A. Donnelly. Illustrated description of a system designed to work under the same principles as those governing mechanical circulations, where a vacuum pump is usually used upon the main return. 1000 w. Am Soc of Heat & Vent Engrs—Jan., 1906. No. 74336 C.

Heating with Ventilation. Discusses systems of heating where ventilation is also required, and methods of determining the sizes of pipes, amount of air, and other requirements. Ills. 2000 w. Special No. Engr, U S A—Jan. 1, 1906. No. 74325 D.

The Flow of Steam through Regulating Valves in Low-Pressure Steam-Heating Plants (Ueber den Dampfdurchgang durch Regulierventile in Niederdruckdampfheizungen). H. Zyka. Applying the formula of Gutermuth to the regulation of low-pressure steam heating, with tables and diagrams. 7500 w. 3 plates. Gesundheits-Ingenieur—May 26, 1906. No. 77635 B.

Steam Heating in a Brooklyn Club Building. Illustrates and describes a

## MECHANICAL ENGINEERING

### Steam

steam-heating system with direct and indirect radiation and water heating for a swimming pool. 2500 w. *Met Work*—Sept. 8, 1906. No. 79023.

### Steam.

Modified Systems in Steam Heating. The present article illustrates and describes the Webster vacuum heating system. 1000 w. *Met Work*—June 2, 1906. Serial. 1st part. No. 77064.

### Theater.

Heating and Ventilating the New Montauk Theater, Brooklyn, New York. Illustrated description of a recent type of upward ventilation. Both direct and indirect radiation are used. 900 w. *Heat & Vent Mag*—March, 1906. No. 75624.

Mechanical Equipment of the New Amsterdam Theater, New York. Describes a system of upward ventilation. Ills. 1500 w. *Heat & Vent Mag*—April, 1906. No. 76358.

### Thermostat.

The Automatic Regulation of the Temperature of Rooms (*Die Selbst-regelung der Raumtemperatur*). Describing an electric thermostat for the control of steam and hot-water radiators. 2000 w. *Gesundheits-Ingenieur*—April 28, 1906. No. 76842 D.

### Train Heating.

See *Railway Engineering, Motive Power and Equipment*.

### Trap.

See *Mechanical Engineering, Steam Engineering*.

### Ventilation.

Centrifugal Ventilating Machines. F. Ernest Brackett. Discusses the method used by some engineers of correlating the size of the fan to the volume of the air, and the scientific basis upon which it rests. 2500 w. *Eng. & Min Jour*—Feb. 3, 1906. No. 74839.

Plenum Ventilation Systems for School Houses (*Ueberdruck-lüftung mit Ventilatoren betrieb in Schulen*). Richard Hoffmann. Discussing both warming and ventilating problems, with diagram for computing the loss of heat through windows. 5000 w. 1 plate. *Gesundheits-Ingenieur*—Jan. 27, 1906. No. 75149 B.

The Ventilation of Theaters (*Die Lüftung der Theater*). H. Pfützner. A general review of methods of theater ventilation, taking into account the relations of

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the stage and the auditorium, and the questions of the relative temperatures and heights of the air columns. 8000 w. *Gesundheits-Ingenieur*—Jan. 20, 1906. No. 75148 B.

The Ventilation System in the Royal Uranium Color Works at St. Joachimsthal (*Die Ventilationsanlage in der K. K. Uranfarbenfabrik zu St. Joachimsthal*). F. Janda. Describing an arrangement of exhaust pipes and hoods over the tanks containing the alkaline solutions. 1800 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—Nov. 4, 1905. No. 73345 D.

Arrangements for the Ventilation of the Debating-Rooms of the New Riksdag's Building in Stockholm, and the Results Obtained in this Respect. William Dahlgren. Discusses whether upward or downward ventilation is more satisfactory. Both were tried and the upward system retained. Ills. 2800 w. *Am Soc of Heat & Vent Engrs*—Jan., 1906. No. 74335 C.

Upward and Downward Ventilation. William J. Baldwin. Favors the upward system of ventilation. 2000 w. *Heat & Vent Mag*—April, 1906. No. 76360.

A Scotchman's Notes on Ventilation. Alexander MacKenzie. From a paper read before the Edinburgh Sanitary Soc. Discusses methods in use, compares the extraction and the plenum systems, favoring the former. 4000 w. *Heat & Vent Mag*—May, 1906. No. 76701.

Notes on the Theory of Disc Ventilating Fans (*Beitrag zur Theorie der Schrauben Ventilatoren*). C. F. Holmboe. Discussing the best shape of blades, deliveries of air for various speeds, and general proportions of ventilating disc fans. 2500 w. *Zeitschr d Ver Deutscher Ing*—June 9, 1906. No. 77605 D.

Working Out a Ventilating System for a Telephone Exchange. Louis Rosenberg. Illustrated description of the plant designed for the operating room of the Cuyahoga Telephone Co. 2500 w. *Heat & Vent Mag*—June, 1906. No. 77501.

### Water Heating.

Improved Devices for Heating Water by Steam (*Neuere Apparate zur Dampfwarmwasserbereitung*). Paul Hoffmann. Illustrating and describing heaters of the counter-current type in which the steam and the water flow in opposite directions. 1800 w. *Gesundheits Ingenieure*—Feb. 3, 1906. No. 75150 B.

### Water Heating

## Air Lift

### Air Lift.

Trial of an Air-Lift Pump. Describes the principle of this pump, and gives results obtained in a test carried out at the Wandsworth and Putney Gas Works. 1700 w. Engng—Sept. 21, 1906. No. 79588 A.

### Centrifugal Pumps.

The Efficiency of Centrifugal Pumps (Die Kreisel und ihre Leistungen). H. Hagens. An appendix to a previous paper giving a mathematical examination of the tests previously recorded. 2000 w. Zeitschr d Ver Deutscher Ing—Oct. 28, 1905. No. 73305 D.

Test of a Three-Stage, Direct-Connected, Centrifugal Pumping Unit. Philip E. Harroun. Notes illustrating test, presented to draw out a general discussion at next meeting. Also short discussion. Ills. 4000 w. Pro Am Soc of Civ Engrs—Dec., 1905. No. 74094 E.

The Latest Developments of the Rateau High-Pressure Centrifugal Pump (Die Neuesten Ausführungstypen der Hochdruck-Kreiselpumpe System Rateau). Julius Divis. Data concerning recent performances of multiple centrifugal pumps. 2000 w. Oesterr Zeitschr f Berg u Hüttenwesen—Dec. 16, 1905. No. 74650 D.

The Sulzer High Pressure Centrifugal Pumps (Sulzer-Hochdruck-Zentrifugal-pumpen). S. Herzog. A general description of the multiple centrifugal pump with guide vanes, as made by Sulzer Brothers, of Winterthur, Switzerland, with curves showing performances and efficiencies at different speeds. Three articles. 7000 w. Elektrotech u Maschinenbau—Jan. 14, 21, 28, 1906. No. 75142 each D.

Sulzer High-Pressure Centrifugal Pumps in Practical Service (Sulzer Hochdruck-Kreiselpumpen in Praktischen Betrieben). Julius Divis. A review of the paper by Ziegler at the Liège Congress, showing efficiencies of more than 75 per cent against the heads of over 400 metres. Two articles. 3000 w. Oesterr Zeitschr f Berg u Hüttenwesen—April 14, 1906. No. 76827 each D.

A New Centrifugal Pump Designed for Use with a Wide Range of Heads. Illustrates and describes the special features and reports tests. 800 w. Eng News—Sept. 27, 1906. No. 79472.

The Theory and Calculations for Centrifugal Fans and Pumps (Theorie und Berechnung der Zentrifugal Ventilatoren und Pumpen). Dr. H. Lorenz. Deriving formulas for the angles and form of

## HYDRAULICS

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vanes for runners for various speeds and discharges, both for fans and pumps. 3000 w. Zeitschr f d Gesamte Turbinenwesen—July 30, 1906. No. 79301 D.

Centrifugal Pumps. P. A. Mossay and G. M. Brown. Abstract of a paper read before the Rugby Engng Soc. Briefly reviews the history of rotary pumps, considers the recent rapid development and its cause, discussing in detail the performance and construction of centrifugal pumps. 3000 w. Mech Engr—Sept. 29, 1906. Serial. 1st part. No. 79684 A.

Centrifugal Pumps and Fans at the Bavarian Exposition at Nuremberg, 1906 (Die Kreisel-Pumpen und Ventilatoren auf der Bayer Jubiläums-Landes-Ausstellung in Nürnberg, 1906). H. Fischer and H. Zeine. Illustrating especially multiple high-pressure centrifugal pumps of the leading Continental makers. 3000 w. Zeitschr f d Gesamte Turbinenwesen—Sept. 20, 1906. No. 79976 D.

Tests of a New Centrifugal Pump. Abstract of a report by Prof. J. E. Denton on tests made on a new design of centrifugal pump. 1500 w. Eng Rec—Sept. 29, 1906. No. 79557.

Test of a Two-Stage Centrifugal Pump. Illustrated description of the method of testing for capacity and efficiency. 1800 w. Engr, U S A—Oct. 15, 1906. No. 79809 C.

### Discharge.

The Discharge of Hot Water (Des Ausfluss von Heissem Wasser). Julius Adam. Experimental researches into the laws of the flow of highly heated water through discharge nozzles. Discharges from boilers under pressures as high as 8 atmospheres were measured, the results being discussed and tabulated. Two articles. 5000 w. Zeitschr d Ver Deutscher Ing—July 21, Aug. 11, 1906. No. 78704, each D.

A Device for Regulating the Discharge of Water from a Reservoir. P. Bouéry. Illustrated description of this device, and report of results obtained. 1800 w. Bul Am Inst of Min Engrs—Sept., 1906. No. 79851.

### Flow.

The Discharge of Water Through Street Taps and House Service Pipes. William Paul Gerhard. Gives double-page diagram with curves plotted by formulae, and explanation of its use. 2500 w. Cassier's Mag—Nov., 1905. No. 72986 B.

The Gauging of Streams by Chemical

# MECHANICAL ENGINEERING

## Flow

Means. Charles Edmond Stromeier. Describes the means by which the chemical method can be most successfully applied in practice. 3500 w. Ills. (No. 3514.) Inst of Civ Engrs. No. 73181 N.

The Resistance Offered to the Flow of Water in Pipes by Bends and Elbows. Connell William Long Alexander. Describes an experimental investigation of the nature and magnitude of the resistance offered by bends, knees, and elbows, to the flow of water through closed pipes. 5300 w. Ills. (Students' Paper No. 526.) Inst of Civ Engrs. No. 73178 N.

The Velocity of Water Flowing Down a Steep Slope. Ernest Prescott Hill. Gives investigations and the assumptions involved. 800 w. (No. 3520.) Inst of Civ Engrs. No. 73161 N.

The Gaging of Streams by Chemical Means. W. L. Butcher. Brief remarks on the usefulness of this method and how to carry it out, also suggesting a method of using aniline dyes. 1100 w. Eng News—Dec. 14, 1905. No. 73733.

Researches for the Determination of a Formula for the Flow of Water over Natural River Beds (Versuch der Aufstellung einer Geschwindigkeitsformel für natürliche Flussbette). Maximilian Matakiewicz. Tables and diagrams for the determination of coefficients and exponents for the modified Chézy formula. 4000 w. Oesterr Monatschr f d Oeffent Baudienst—Dec. 23, 1905. No. 74667 D.

Researches for the Determination of a Formula for the Flow of Water over Natural River Beds (Versuch der Aufstellung einer Geschwindigkeitsformel für natürliche Flussbette). R. Siedek. A review of the previous paper of Dr. Max Matakiewicz, comparing his results and the author's with actual measurements. 6000 w. Oesterr Wochenschr f d Oeffent Baudienst—May 26, 1906. No. 77622 D.

The Friction of Flowing Water in Pipes (Strömung Reiben der Flüssigkeiten in Rohrleitungen). L. J. Bodaszewski. A review of the formulas of Helmholtz, Neumann and others, with tables computed for the constants under various conditions. 2000 w. Zeitschr d Oesterr Ing u Arch Ver—May 25, 1906. No. 77615 D.

A Velocity Registering Device (Construction d'un Appareil à Enregistrer les Vitesses). M. Parenty. Describing a form of recorder for use with a modification of the Pitot tube for registering the flow of water through pipes and conduits. 7500 w. Ann d Ponts et Chaus-

## HYDRAULICS

## Hydraulic Machinery

sées—I Trimestre, 1906. No. 78133 E + F.

### Fountains.

Fountain Flow of Water in Vertical Pipes. F. E. Lawrence and P. L. Braunschworth. Describes experiments carried out to obtain a general law for the fountain flow of water from vertical pipes of any size and for any head over the crest. Ills. 8800 w. Pro Am Soc of Civ Engrs—Aug., 1906. No. 78873 E.

### Governors.

The Speed Regulation of Turbines (Die Geschwindigkeitsregulierung der Turbinen). A. Budau. A review of the improvements which have been made during the past thirty years, with especial reference to Continental practice. 5000 w. Zeitschr, d Oesterr Ing u Arch Ver—Nov. 17, 1905. No. 73820 D.

Governor upon the Combined Principles of Inertia and Interference (Regulator mit Kombiniertem Inertie und Interferenzprinzip). Josef Pirkel. Describing the Budau water-wheel governor, with a mathematical analysis of its action. 4000 w. Elektrotechnik u Maschinenbau—Aug. 5, 1906. No. 78758 D.

Some Stepping Stones in the Development of a Modern Water-Wheel Governor. Mark A. Raplogle. Describes a mechanical governor and some of the principles that enter into its construction, showing the steps that led to the development. 5500 w. Am Soc Mech Engrs, No. 095-B—May, 1906. No. 76105.

Speed Regulation of Water-Power Plants. John Sturgess. Considers elements of design in water-wheels, and characteristics of governor action as obtained in the best practice of the present day. 3500 w. Ills. Am Soc of Mech Engrs, No. 095-D—May, 1906. No. 76107.

The Regulation of High-Pressure Water-Wheels for Power-Transmission Plants. George J. Henry, Jr. Discusses the various devices used for protection and regulation, their advantages and defects. Ills. 4000 w. Am Soc of Mech Engrs, No. 095-C—May 1, 1906. No. 76106.

### Hydro-Electric Stations.

See Electrical Engineering, Generating Stations.

### Hydraulic Machinery.

The Selection of Material for the Construction of Hydraulic Machinery. Arthur Falkenau. Notes on the determining factors in the selection of the materials to be used. 1800 w. Jour Fr Inst—March, 1906. No. 75557 D.

# MECHANICAL ENGINEERING

## Intensifier

The Mechanical Uses of Water under Pressure. Wm. M. Barr. A fully illustrated discussion of the design and uses of hydraulic tools and appliances. 3500 w. *Engineering Magazine*—September, 1906. No. 78772 B.

## Intensifier.

Steam Hydraulic Intensifier for Hydraulic Presses. Illustrates and describes an arrangement of drop valves, which close positively and are not liable to leak, used for controlling the admission and exhaust of steam to and from the steam cylinder of the intensifier. 1200 w. *Mech Engr*—July 7, 1906. No. 77975 A.

## Irrigation.

Irrigation in Western Canada. Lawrence J. Burpee. An illustrated article describing the extensive irrigation work in Alberta undertaken by the Canadian Pacific Railway. 3000 w. *Sci Am Sup*—Sept. 29, 1906. No. 79503.

## Laboratory.

The Hydraulic Testing Laboratory of the Worcester Polytechnic Institute. Charles M. Allen. Illustrated detailed description of this plant, which furnishes facilities for a large variety of hydraulic experiments. 2300 w. *Eng Rec*—March 31, 1906. No. 75883.

The New Hydraulic Laboratory at the University of Wisconsin. D. W. Mead. Illustrated detailed description of this new laboratory and its equipment. 3000 w. *Wis Engr*—March, 1906. No. 76322 D.

## Low Head.

Economies to be Derived from the Utilization of Water Powers of Low Head in the Central West. Dugald C. Jackson. An account of the way the electric light company in Janesville, Wis., improved its condition and produced current with so much economy as to greatly increase the use of the product. 4400 w. *Pro Am Inst of Elec Engrs*—July, 1906. No. 78358 D.

## Niagara.

Niagara Power Schemes. Review of a lecture by Prof. Unwin before the students of the Institution of Mechanical Engineers. An account of the stations already established, and problems which had to be considered, with brief reference to the effect on the Falls. 3700 w. *Engng* Feb. 16, 1906. No. 75289 A.

The Diversion of Water from Niagara. Alton D. Adams. Gives a review of the plants along the water front of the park, aiming to show that only a small part of the water diverted in Queen Victoria Park could have found its way to the American

## HYDRAULICS

## Plumbing

Falls. 1600 w. *Elec Wld*—April 28, 1906. No. 76592.

Raise the Horseshoe Falls. Alton D. Adams. States the conditions and future outlook at Niagara, and the probable necessity of erecting a dam near the crest of the Horseshoe falls, if the power plants nearest the falls remain unimpaired. 2000 w. *Elec Rev, N Y*—Aug. 4, 1906. No. 78387.

## Oil Pumping.

Rifled Pipe for Pumping Heavy Crude Fuel Oil. John H. Isaacs. Explains the troubles encountered in trying to pipe this oil, and the results obtained with rifled pipe. Describes the rifling machine used, giving illustrations. 2000 w. *R R Gaz*—June 8, 1906. No. 77233.

## Orifice.

Some Experiments on the Frictionless Orifice. Horace Judd and Roy S. King. Gives results of a series of experiments on frictionless orifices undertaken to determine stated points. Ills. 5500 w. *Eng News*—Sept. 27, 1906. No. 79471.

## Piezometer.

See Mechanical Engineering, Measurement.

## Pipe Conduit.

Designing the 18-Ft. Steel Pipe of the Ontario Power Company, Niagara Falls. Joseph Mayer. Deals with studies in connection with the design of this pipe, its protection against rust and its probable life; its resistance to deformation, its stability, etc. 7000 w. *Eng News*—April 26, 1906. No. 76339.

## Pipe Lines.

Rifled Pipe for Conducting Heavy Crude Fuel Oil. John D. Isaacs. Illustrated description of this process, explaining the principle upon which it is based. 1200 w. *Sci Am Sup*—Sept. 15, 1906. No. 79178.

## Power.

Sale of Water-Power from the Power Company's Point of View. C. E. Parsons. Read before the N. Y. State Convention. Describes the system of the Hudson River Electric Power Co., and some of the important works in connection with its high-voltage of transmission, and discusses methods of making contracts for railway energy. 5000 w. *St Ry Jour*—June 30, 1906. No. 77731 C.

## Plumbing.

The Durham System of Plumbing. A serial, in three parts, illustrating and describing this system. 1300 w. *Met Work*—Nov. 4, 1905. Serial. 1st part. No. 72983.

# MECHANICAL ENGINEERING

## Pumping

Plumbing in the Butterick Building, New York. Illustrated detailed description of the water supply and drainage system in a large mercantile and office building. 2000 w. Met Work—Dec. 9, 1905. No. 73610.

Water: Its Composition, Filtration, Storage and Quantity Required for Domestic Use. Alfred E. Edwards. With a description of the plumbers' work, and appliances used in connection with its storage and distribution. Ills. 3800 w. Plumb & Dec—Sept. 1, 1906. No. 79-103 A.

## Pumping.

Pumping Plant for the New Graving Dock at Quarry Bay, Hong Kong. Illustrated description of one of the largest electrically-driven plants of its kind. 1800 w. Engr, Lond—Oct. 12, 1906. No. 80061 A.

Pumping Engines and Pumping Machinery. Oscar F. Rabbe. Read before the Ohio Soc. of Mech., Elec., & Steam Engrs. Discussing some of the sources of trouble, the data that should be included in specifications, &c. 1500 w. Engr, U S A—Dec. 1, 1905. No. 73619 C.

The Return-Air and Pumping System. Frank Richards. An explanation of this system and its operation. 1800 w. Compressed Air—Aug., 1906. No. 78593.

See Also Mining and Metallurgy, Mining.

See also Civil Engineering, Water Supply.

## Pumping Plant.

Electric Motor Centrifugal Pumping Plant for Draining the Torresdale Tunnel, Philadelphia. Illustrates and describes a simple and efficient pumping plant, comprising as its distinctive elements, two high speed DeLaval electric motor centrifugal pumps, which promises wide usefulness in shaft sinking operation. 1200 w. Eng News—Jan. 25, 1906. No. 74568.

Electric Pumping Plant at Consett Ironworks. An illustrated description of the scheme adopted, the pumps having a capacity of nearly 8,600,000 gallons of water pumped in twenty-four hours. 2500 w. Engr, Lond—Jan. 12, 1906. No. 74526 A.

A Large Rotary Pump Plant. Brief illustrated description of the Pine Island plant for irrigating a Southern rice field; two pumping plants were installed in order to divide the lift. 900 w. Am Mach—Vol 29. No. 4. No. 74823.

See Civil Engineering, Water Supply.

## HYDRAULICS

### Pumps.

An Unusual Pump. Illustrated description of an installation for the water supply of Catlettsburg and Ashland, Ky., explaining the conditions it is adapted to meet. 1800 w. Eng Rec—Nov. 25, 1905. No. 73498.

The Centrifugal Pump and Its Application. Harry Y. Haden. Gives examples illustrating the working conditions and showing the efficiency, reporting a test on an electro-motor pump of 1200 gallons a minute capacity and 45 feet head. 1200 w. Jour of Elec—March, 1906. No. 75470 C.

The Development of the Single Steam Pump. S. J. Berard and W. C. McLeod. An illustrated article giving a general idea of the uses of various types of pumping engines, with detailed descriptions. 2200 w. Yale Sci M—March, 1906. No. 75823 C.

High-Lift Turbine Pumps. Their Design and Efficiency. R. J. Durley. A study of the principles which have been applied to extend both the efficiency and the capacity of the centrifugal pump, with examples of service applications. 4500 w. Engineering Magazine—July, 1906. No. 77683 B.

Pumps for Gases, Petroleum and Chemicals (Pumpen für Gase, Erdöle, und Chemische Produkte). G. Hagemann. Describing especially plunger pumps with removable linings, valve-seats, etc., especially adapted for inspection and repair. 1500 w. Glasers Annalen—Sept. 1, 1906. No. 79335 D.

### Pump Speeds.

The Minimum Rotative Speed of Pumps (Die Kleinste Mögliche Umlaufzahl von Pumpwerken). G. Goldstein. Discussing especially fly-wheel pumps and comparing the computed minimum speeds with those observed in practice. 2500 w. Zeitschr d Ver Deutscher Ing—Feb. 17, 1906. No. 75703 D.

### Pump Tests.

A New Method of Measuring Water in Pump Tests. E. H. Birney. Describes a plan adopted in testing a pump, under actual operating conditions, to determine if certain guarantees were fulfilled. Ills. 900 w. Power—May, 1906. No. 76364 C.

### Recuperation.

The Recuperation of Waterfalls (La Recuperation des Chutes d'Eau). A. Bernoud. The injector action of the discharge of water through sluices is used to augment the effective head. The plant at Chèvres near Geneva, is de-



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## Stream Flow

scribed. Two articles. 4000 w. Bull Tech de la Suisse Romande—Feb. 10, March 25, 1906. No. 76264, each D.

## Stream Flow.

See Civil Engineering, Waterways, Measurement.

## Turbine Plants.

Preliminary Plans for Turbine Plants (Erster Entwurf von Turbinenanlagen). N. Baashuus. Discussing the simple calculations required to determine the general questions involved in the planning of a hydraulic turbine installation. 4000 w. Elektrotech Zeitschr—Oct. 18, 1905. No. 73347 B.

Foreign and American Hydraulic and Turbine Plants. Frank C. Perkins. Gives illustrations and brief descriptions of plants showing the arrangement of horizontal shaft turbines, and vertical shaft turbines, and the types of governors employed. 1700 w. Engr, U S A—Dec. 1, 1905. No. 73615 C.

## Turbine Pump.

Large Turbine Pump for the Montreal Water and Power Company. Illustrated description of a pump designed to deliver 6½ million imperial gallons per twenty-four hours against a head of 30 ft. 1000 w. Engng—Feb. 2, 1906. No. 74996 A.

Turbine Pumps with Balanced Impellers. Gives illustrations and test results of two turbine pumps. The main feature is the use of back-to-back impellers, supplemented by an arrangement of thrust-chambers. 1800 w. Eng News—April 5, 1906. No. 75949.

## Turbines.

German Turbines at Niagara (Deutsche Turbinen am Niagara). Albert Ungerer. With illustrations and descriptions of the Francis type of turbines built by Voith, of Heidenheim, Württemberg, for the Hamilton, and the Ontario Power Companies at Niagara Falls. 2500 w. Zeitschr d Ver Deutscher Ing—Dec. 16, 1905. No. 74600 D.

Studies upon the Pressure on the Step Bearing of the Vertical Shaft of the Francis Turbine (Studien über den Druck auf den Spurzapfen der Francis Turbinen mit Lotrechter Wellen) Dr. Karl Kobes. A mathematical discussion of the action of weight and water pressure upon the pivot of the vertical shaft in turbines of the Francis type. Serial. Part I. 5000 w. Zeitschr d Oesterr Ing u Arch Ver—Jan. 12, 1906. No. 74641 D.

The Best Point for Pivoting Turbine Guide Buckets (Experimentelle Bestimmung des Günstigen Drehpunktes von Turbinendreh-schau-feln) Dr. R. Camerer.

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Describing experiments to determine the action of the hydraulic forces on turbine guides to find the best position for pivoting with respect to ease of movement. 1500 w. Zeitschr d Ver Deutscher Ing—Jan. 13, 1906. No. 74611 D.

Hydraulic Turbines (Turbines Hydrauliques). M. Abraham. A general examination of the various types of turbine watch wheels, with a mathematical discussion of the mechanical principles involved in turbine design. Serial. Part I. 3000 w. Revue Technique—Oct. 25, 1905. No. 73832 D.

The Distribution of Pressure in the Francis Turbine, and the Pressure on the Step (Die Druckverhältnisse in der Francis Turbine und der Druck auf den Spurzapfen). Karl Kobes. A mathematical investigation of the action of the water-pressure in turbines of the Francis type, with especial reference to the load on the spindle step. 5000 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 8, 1905. No. 73825 D.

Pressures in the Rotating Mass of Water and Axial Thrust in a Francis Turbine with Horizontal Shaft (Die Druckverhältnisse in einer um eine Horizontale Achse Rotierenden Wassermasse und der Achsiale Schub bei Francis Turbinen mit Liegender Welle). Dr. Karl Kobes. An analytical and graphical examination of the pressures in unbalanced horizontal turbines. 4000 w. Zeitschr d Oesterr Ing u Arch Ver—March 2, 1906. No. 75734 D.

A 10,000 H. P. Single-Wheel Turbine at Snoqualmie Falls, Wash. Arthur Giesler. Information of interest and illustrated description of the largest turbine of its type ever built. 3000 w. Eng News—March 29, 1906. No. 75864.

Efficiency Tests of Turbine Water Wheels. William O. Webber. Records a series of consecutive tests under uniform conditions of four water wheels, with the same apparatus, and same observers, to determine the efficiency, and other points of operation. Ills. 2000 w. Am Soc of Mech Engrs, No. 088—May, 1906. No. 76109.

Theory and Computation for Turbines and Centrifugal Pumps (Theorie und Berechnung des Vollturbinen und Kreiselpumpen). Dr. K. Kobes. A review of the discussion of Dr. Lorenz showing the working method of constructing the bucket curves from the formulas. 1200 w. Zeitschr u Ver Deutscher Ing—April 14, 1906. No. 76210 D.

Turbine Design as Modified for Close Regulation. George A. Buvinger. An

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## Turbines

illustrated discussion of the types of gates now in use for regulation, explaining their action. 2700 w. Am Soc of Mech Engrs. No. 095 E—May, 1906. No. 76108.

A New Method of Turbine Control. Lamar Lyndon. Illustrates and describes a new method of turbine control, giving formulæ and facts on which the design is based. It consists primarily in changing rapidly the gate-opening of the turbine without changing the pressure or velocity of the water. 3500 w. Pro Am Inst of Elec Engrs—May, 1906. No. 76943 D.

Notes on the Characteristics of the Francis Turbine (Beiträge zur Charakteristik der Francis Turbine). Robert Löwy. Deriving constants for use in the classified formulas for turbine computations for wheels of the Francis type, according to the head and velocity. 2500 w. Elektrotech u Maschinenbau—April 15, 1906. No. 76845 D.

Pressure on the Pivot of the Jonval Turbine (Der Druck auf den Spürzapfen der Jonval Turbinen). Dr. Karl Kobes. A mathematical study of the water pressures in turbines of the Jonval type, showing the proportion of the vertical pressure to be supported by the step bearing of the shaft. 6000 w. 1 plate. Zeitschr d Oesterr Ing u Arch Ver—April 20, 1906. No. 76821 D.

A 10,500 Horse-Power Turbine with Volute Casing. W. M. White. An explanation of the new conditions that have caused a change in turbine construction, with an illustrated description of a wheel designed to develop 10,500 horse-power, with a guaranteed efficiency of 78 per cent. 2500 w. Am Mach—Vol. 29. No. 32. No. 78518.

Efficiency Tests of the Mos. Löw-Beer Hydraulic Power Plant at Sagan, Silesia (Leistungsversuche an der Wasserkraft-Anlage von Mos. Löw-Beer in Sagan, Schles). R. Camerer. Data and results of tests of double Francis turbines, with tables and curves of efficiencies at various heads and gates. 2500 w. Zeitschr d Ver Deutscher Ing—Aug. 4, 1906. No. 78710 D.

Standard Notation in Turbine Design (Einheitliche Bezeichnungen im Turbinenbau). Prof. R. Camerer. A discussion of the various plans to determine a uniform notation for the various angles and other elements of hydraulic turbines of the Francis type. Serial. Part 1. 4000 w. Zeitschr f d Gesamte Turbinenwesen—Oct. 10, 1906. No. 79977 D.

## Valves.

The Slip of Discharge Valves. C. H.

## HYDRAULICS

Benjamin. A report of experiments made to determine the effect of variations in the lift and stiffness of the spring on the discharge through the valves of a feed pump. 700 w. Engr, U S A—Nov. 15, 1905. No. 73259 C.

Valves for High-Speed Pumps (Ventile Raschlaufender Pumpen). Hermann Sturm. Describing the Guterth valve of flat rolled spring metal, giving extreme lightness and quick action. 1800 w. Elektrotech u Maschinenbau—Oct. 7, 1906. No. 79968 D.

## Victoria Falls.

The Victoria Falls as a Source of Power. William A. Carter. Illustrated description, and discussion of this scheme of power transmission for South Africa. 1000 w. Power—Oct., 1906. No. 79461 C.

## Water Meters.

See Civil Engineering, Measurement.

## Water Power.

Water-Power Plants; Common Troubles, Causes, and Remedies. W. E. Crane. A brief discussion of early plants, of shape of dams, and the remedies for various troubles. Ills. 1700 w. Power—Dec., 1905. No. 73700 C.

Adirondack Power. Alton D. Adams. On the immense undeveloped water power available from the Adirondack Mts. 1000 w. Elec Rev, N Y—Feb. 24, 1906. No. 75255.

The Water Power Development of the Chicago Drainage Canal. Illustrated detailed description of works required to develop this power. 5800 w. Eng Rec—Feb. 17, 1906. No. 75055.

The Commercial Utilization of the Hydraulic Power of the Upper Rhine from Neuhausen to Breisach (Die Wasser Kräfte des Oberrheins von Neuhausen bis Breisach und ihre Wirtschaftliche Ausnützung). H. E. Gruner. A review of the flow of the Rhine below the Falls and above Colmar, showing the points at which power developments are practicable. 2000 w. Schweiz Bauzeitung—May 12, 1906. No. 76844 B.

The Monopoly of Hydraulic Power in Switzerland (Die Monopolisierung der Schweizerische Wasserkräfte). H. E. Gruner. An exhaustive discussion of the legal and industrial questions involved in the National control of hydraulic power in Switzerland, including the prohibition of the transmission of energy out of the country. Two articles. 6000 w. Schweiz Bauzeitung—March 24, 31, 1906. No. 76250 each B.

Factors Which Influence the Character of Southern Water Power Develop-

# MECHANICAL ENGINEERING

## Water Power

ment. Joseph M. Roman. Explains some of the difficulties in connection with work at low heads in a country of cheap coal. Describes the type of power development adapted to the conditions. 1700 w. Elec Wld—Aug. 11, 1906. No. 78526.

The New Water Power Plant of the Blackstone Manufacturing Co. Illustrates and describes a water power plant erected on the Blackstone River for the operation of extensive cotton mills in the town of North Smithfield, R. I. 2800 w. Eng Rec—Aug. 11, 1906. No. 78502.

The Utilization of Water Power (Die Verwertung der Wasserkräfte). MM. Lauda and Goeb. An extended review of the development of the power of streams in central Europe, with examples of important hydro-electric stations. 12000 w. 3 plates. Oesterr Wochenschr f d

## MACHINE WORKS AND FOUNDRIES

## Bearings

Oeffent Baudienst—Sept. 22, 1906. No. 79978 D.

## Waves.

The Theory of the Propagation of a Single Wave along a Horizontal Elastic Tube (Théorie de l'Onde Solitaire qui se Propage le Long d'un Tube Elastique Horizontal). A. Boulanger. A mathematical examination of the propagation of the impulse produced in a tube filled with liquid and suddenly compressed at one end. 1500 w. Comptes Rendus—Dec. 11, 1905. No. 74638 D.

See Civil Engineering, Water Supply.

## Weirs.

On the Section of Weirs. W. G. Bligh. Reviews generally the subject of dams as introductory to a series of articles investigating the conditions governing the design of the section of weirs. 3000 w. Engr, Lond—Aug. 17, 1906. Serial. 1st part. No. 78856 A.

# MACHINE WORKS AND FOUNDRIES

## Air Furnaces.

Operation of Air Furnaces. L. G. Blunt. Discusses the method of making up the bottom, of calculating the charge, of placing metal in furnace, flame regulation, and taking of the fracture tests. Ills. 1200 w. Foundry—Nov., 1905. No. 72917.

Air Furnace Practice. Ralph H. West. From a paper read before the Am. Found. Assn. An illustrated article describing details of these furnaces and their working. 2000 w. Ir Age—July 5, 1906. No. 77771.

## Annealing.

The Automatic Annealing of Metals. Illustrates and Describes the Bates-Peard continuous annealing furnace for non-ferrous metals. 1200 w. Ir Age—April 5, 1906. No. 75919.

Some Annealing Methods. E. S. Wheeler. Illustrated description of modern methods of annealing work that passes through the toolmaker's hands. 1100 w. Mach, N Y—Aug., 1906. No. 78333 C.

The Annealing of Non-Ferrous Metals. Illustrated description of the Bates-Peard continuous annealing furnace for non-ferrous metals. 3000 w. Ir & Coal Trds Rev—Sept. 7, 1906. No. 79244 A.

Annealing Under Gas. Walter J. May. Presents the advantages of this method for bright steel work. 800 w. Prac Engr—Sept. 28, 1906. No. 79681 A.

## Appliances.

Two Novel Workshop Appliances. Il-

lustrates and describes a modern hand-planing tool, and an adjustable die stock. 600 w. Mech Engr—Jan. 13, 1906. No. 74508 A.

## Apprentices.

See Industrial Economy.

## Arsenal.

The United States Arsenal at Frankford. F. A. Stanley. Begins an illustrated detailed description of this arsenal, at Philadelphia, its equipment and manufactures. 2300 w. Am Mach—Vol. 28, No. 50. Serial. 1st part. No. 73765.

## Axle Factory.

Methods of a Modern Vehicle-Axle Plant. Charles A. Trask. Illustrated detailed description of methods in use at a plant in Jackson, Michigan. 2500 w. Am Mach—Vol. 29, No. 12. No. 75641.

## Balancing.

Balancing at High Speeds. E. R. Douglas. Discusses the importance of accurate balancing in turbine work, and the methods and problems. 2800 w. Am Mach—Vol. 29, No. 8. No. 75234.

## Band-Saw.

Electrically-Driven Band-Saw for Metal. Illustrations, with short description. 500 w. Engng—March 16, 1906. No. 75806 A.

## Bearings.

Experimental Determination of the Relative Value of Short Bearings. Reports some experiments made by H. E. Hayward for the Link Belt Engng. Co.

# MECHANICAL ENGINEERING

## Bells

which show that, under the conditions of chain links, the usual assumption is not correct. Ills. 1000 w. Am Mach—Vol. 28, No. 52. No. 74035.

Ball and Roller Bearings. Henry Hess. Abstracted from the discussion on bearings at the N. Y. meeting of the A. S. M. E. A brief review. Ills. 2200 w. Am Mach—Vol. 29, No. 11. No. 75520.

The Performance of a Large Experimental Bearing. Albert Kingsbury. A contribution to the discussion at the Dec., 1905, meeting of the A. S. M. E. Illustrated account of tests made by the Westinghouse Electric and Manufacturing Co., at the East Pittsburg Works. 1000 w. Am Mach—Vol. 29, No. 11. No. 75519.

## Bells.

The Bell Industry. Storrs Ely Emmons. Brief illustrated account of the factories at East Hampton, Conn., and their history. 1000 w. Mach, N Y—June, 1906. No. 77098 C.

## Bessemer.

The Value of the Small Bessemer Plant in the Machine Works (Die Bedeutung der Kleinbessemerie für die Eisenhüttenindustrie und den Maschinenbau). Hans van Gendt. A discussion of the extent to which a small Bessemer converter may be economically employed in the ordinary foundry. 3000 w. Stahl u Eisen—Dec. 15, 1905. No. 74643 D.

## Blast Pressures.

A Plea for Lower Blast Pressures in Cupola and Air Furnaces. William H. Coleman. Read before the A. F. A. Convention. Discusses high and low blast pressures and the best practice under present conditions. 4000 w. Foundry—Sept., 1906. No. 79272.

## Boiler Making.

Laying Out a Plain Cylindrical Boiler. George Guntz. Directions, with diagrams. 1200 w. Boiler Maker—June, 1906. No. 77251.

## Boiler Repairs.

Repairing Locomotive and Other Types of Boilers. R. E. M'Namara. Deals with this subject, especially the repairing of water-tube boilers. 2500 w. Boiler Maker—April, 1906. Serial. 1st part. No. 75992.

## Boiler Works.

The Lake Erie Boiler Works, Buffalo, N. Y. Illustrated detailed description of the works and their equipment. 1400 w. Boiler Maker—Oct., 1906. No. 79724.

## Boring.

An Ingenious Contrivance. Edward

## MACHINE WORKS AND FOUNDRIES

## Brass Wire

Sette. Illustrated description of an arrangement for boring connecting rod brasses on a blacksmith's drill press. 500 w. Ice & Refrig—July, 1906. No. 77764 C.

A Corliss Cylinder Boring Machine. Illustrated description of a machine designed for simultaneously machining the bore, valve chambers and flanges of Corliss cylinders up to 36 inches bore by 8 ft. long. 500 w. Am Mach—Vol. 29. No. 212. No. 77057.

## Boring Mill.

A New Bullard Boring Mill. Illustrated description of a new 54-inch rapid production boring and turning mill, noting its features of interest. 1500 w. Ir Age—Nov. 30, 1905. No. 73517.

Designing a Boring Mill. Gives the reasoning of the author in preparing a design for a boring mill of 6 feet swing to take 48 inches under the cross rail. Ills. 3500 w. Am Mach—Vol. 29, No. 10. No. 75426.

Designing a Boring Mill. A. L. de Leeuw. A critical review of an article appearing in No. 10, of the present volume of this paper. 5500 w. Am Mach—Vol. 29. No. 15. No. 76032.

A Floor Plate Boring Mill at the Crocker-Wheeler Works. Illustrated detailed description of machinery used in the construction of heavy electrical apparatus. 2000 w. Mach, N Y—Nov., 1905. No. 72938 C.

## Brakes.

Brakes. C. F. Blake. The present article discusses the performance of brakes as regards heating, giving formulas. The design of crane brakes is considered. 2500 w. Mach, N Y—Aug., 1906. Serial. 1st part. No. 78330 C.

## Brass.

Brass Melting and Mixing. Erwin S. Sperry, in *The Brass World*. Considers their effect on the quality of the casting. 4000 w. Mech Engr—July 14, 1906. No. 78209 A.

## Brass Melting.

The Electric Induction Furnace in Brass Melting. Explains the three classes of electric furnaces, describing the induction furnace and stating its advantages for melting metal. Ills. 2500 w. Brass Wld—Sept., 1906. No. 79494.

## Brass Wire.

The Manufacture of Brass Wire. E. J. Bolton. Read before the Graduates Assn. of Inst. of Mech. Engrs. A general description of the methods of manufacture, showing the advantages and disadvantages of various ways of obtaining brass

# MECHANICAL ENGINEERING

## Brazed Joints

and converting it into wire. 3000 w. Mech Engr—Oct. 20, 1906. No. 80128 A.

## Brazed Joints.

The Strength of Brazed Joints in Steel Wire. Henry Louis. Read before the British Inst. of Min. Engrs. Reports tests made to determine whether it is possible to produce a brazed joint equal in strength to the original wire. 1200 w. Ir & Coal Trds Rev—June 15, 1906. No. 77493 A.

## Cams.

The Double Cam System of the Mono-type. Illustrated detailed description of the system used and the cam-cutting machine. 2000 w. Am Mach—Vol. 28, No. 50. No. 73766.

Notes on the Cam Chart. John Roy. On the laying out of cam charts, with a comparison with article published by C. F. Smith. 1500 w. Am Mach—Vol. 29, No. 11. No. 75517.

Laying out Cams on the Castings. R. E. Weinland. Describes simple and practical methods for use in laying out ordinary cams. Ills. 1500 w. Am Mach—Vol. 29. No. 29. No. 78051.

The Design of Cams. W. O. Horsnaill. Gives examples illustrating the correct method of designing cams. 1300 w. Engr, Lond—July 20, 1906. No. 78316 A.

## Cartridge Cases.

The Manufacture of Cartridge-Cases for Quick-Firing Guns. Col. Leandro Cubillo, and Archibald P. Head. Illustrates and describes the new plant at the Royal Spanish Arsenal at Trubia, Spain, for the manufacture of brass cartridge-cases, stating the advantages of metal cases, and giving some of the mechanical properties which show brass to be best suited for this service. 9000 w. Inst of Mech Engrs—Oct. 20, 1905. No. 73006 D.

## Car Wheels.

Machine Molding and Continuous Casting of Car Wheels. Illustrated detailed description of the process as carried out at the plant of the American Car & Foundry Co., Terre Haute, Ind. 3000 w. Ir Age—Jan. 4, 1906. No. 74214.

## Case Hardening.

Some Obscure Points in the Theory of Cementation (Sur Quelques Points Obscures de la Théorie de la Cementation). M. Partiot. A study of the laws which govern the penetrating depth of case hardening operations, together with the action of various cementing materials. 3000 w. Revue de Métallurgie—Sept., 1906. No. 79930 H.

## MACHINE WORKS AND FOUNDRIES

## Castings

### Castings.

Making a Clutch Coupling on the Molding Machine. George Buchanan. An illustrated description of the method employed. 700 w. Am Mach—Vol. 28. No. 45. No. 73078.

Making a Pattern and Mold for a Power Press. R. H. Palmer. Illustrates and describes inexpensive method of making a pattern when only one casting is required. 1800 w. Am Mach—Vol. 28. No. 46. No. 73213.

Standard Specifications for Gray Iron Castings. Gives the specifications adopted by the American Society for Testing Materials. Ills. 600 w. Ir Trds Rev—Nov. 2, 1905. No. 72976.

Casting Non-Ferrous Metals. From *Eisen Zeitung*. Suggestions for successful work in the casting of bronze, brass, copper, and various alloys. 1000 w. Mech Engr—Nov. 25, 1905. No. 73589 A.

Open Hearth Steel Castings. W. M. Carr. The first of a series of articles treating of the important points of their manufacture by the acid and by the basic open hearth processes. 3000 w. Foundry—Dec., 1905. Serial. 1st part. No. 73944.

Steel Castings and the Constitution of Steel. Percy Longmuir. Discusses the effect of various constituents and methods on the structure and qualities. Ills. 1500 w. Ir Trd Rev—Nov. 30, 1905. No. 73503.

Strength of Hydraulic Press Castings. Frank B. Kleinhaus. Describes the work of forming steel plates into various shapes by the hydraulic press. Diagrams. 700 w. Ir Trd Rev—Nov. 30, 1905. No. 73504.

Why Castings Curve. From the *English Mechanic and World of Science*. Discusses the causes and remedies. Ills. 2500 w. Sci Am Sup—Dec. 16, 1905. No. 73729.

Handling and Machining Large Engine Frames. B. B. Gaffer. Illustrated description of the various operations from pouring the molds to loading for shipment. 1500 w. Am Mach—Vol. 29. No. 5. No. 74815.

Open-Hearth Steel Castings. W. M. Carr. Illustrates and describes a modern stationary furnace of 20 tons' capacity, and gives some arguments in favor of movable types; also some general rules as to points of construction and volumes. 3000 w. Foundry—Feb. 1906. No. 75204.

Statuary Casting Department of the Gorham Mfg. Co., Providence, R. I. Illustrated description of the work of

# MECHANICAL ENGINEERING

## Castings

## MACHINE WORKS AND FOUNDRIES

## Chuck

molding and casting statues. 1500 w. Foundry—Feb, 1906. No. 75205.

A Crooked Molding Machine Job. F. W. Hall. Describes work on a Paxson-Hall molding machine which had a very crooked pattern. Ills. 3000 w. Am Mach—Vol. 29. No. 17. No. 76333.

Open-Hearth Steel Casting. W. M. Carr. Discusses the manipulation of heats in acid practice. 2300 w. Foundry—April, 1906. No. 75937.

Some old Bronze Castings. Illustrates and describes interesting castings found at Pompeii and Herculaneum. 1200 w. Foundry—May, 1900. No. 76709.

Designing and Building a Machine Part. H. P. Fairfield. Illustrated description of a casting from its first inception, to the point where it becomes a finished part. 1200 w. Mach, N Y—July, 1906. No. 77705 C.

Direct Castings from the Blast Furnace. W. H. Butlin. Reports results obtained by mixing ores of different composition in the blast furnace, claiming that with necessary knowledge and skill in manufacture, as good results can be obtained as with a cupola. Ills. 2000 w. Cassier's Mag—July, 1906. No. 77999 B.

The Production of Sound Copper Sand Castings by the Use of Magnesium. E. S. Sperry. Directions for the use of magnesium in the making of copper castings. 2400 w. Ir & Coal Trds Rev—Aug. 17, 1906. No. 78860 A.

Cleaning Castings with the Sand Blast. Illustrated review of machines designed in Germany for this purpose. 1000 w. Ir & Coal Trds Rev—Aug. 24, 1906. Serial. 1st part. No. 79021 A.

Modern Bell Casting. Dr. Alfred Gradenwitz. An illustrated article describing methods of casting and suspending bells. 1200 w. Sci Am—Sept. 15, 1906. No. 79176.

A Peculiar Chilled Casting. George C. Davis. Read before the Phila. Found. Assn. Describes the casting, giving illustrations and the method of charging. 700 w. Ir Age—Oct. 11, 1906. No. 79691.

Converter Steel Castings Practice. Arthur Simonson. The first of a series of illustrated articles aiming to give a general idea of the science and art of making steel castings in a foundry equipped with the Tropenas system of steel making. The present number describes the mechanical part of a Tropenas plant. 3000 w. Foundry—Oct., 1906. Serial. 1st part. No. 79743.

Difficult Castings Made by Green Moulders. An illustrated study of the

conditions in Milwaukee which shows that even the most difficult castings can be made by unskilled labor with a good foreman. Also editorial. 2500 w. Ir Trd Rev—Oct. 25, 1906. No. 80102.

Semi-Steel Castings. Harry Malone. Explains what this material really is. 400 w. Foundry—Oct., 1906. No. 79741.

The Use of Manganese in Making Brass Castings. M. Palfrey. Discusses the advantages of manganese and some of the difficulties in using it, describing the method of the writer. Ills. 1500 w. Brass Wld—Oct., 1906. No. 80065.

## Cast Iron.

Cast Iron in the Foundry. Percy Longmuir. Presents some aspects of foundry practice in the mixing, melting and molding of castings. Ills. 5000 w. Jour of W of Scotland Ir & St Inst—Dec., 1905. No. 74720 D.

Cast-Iron in the Foundry. Abstract of a paper by P. Longmuir, read before the W. of Scotland Ir. & St. Inst. Discusses the composition, treatment, etc., to produce the best castings. 2500 w. Mech Engr—June 2, 1906. No. 77263 A.

Heat Treatment of Cast Iron. P. Munnock. Gives diagrams, showing the utility of a diagram from a transverse testing machine, explaining the method of taking the diagrams. 1000 w. Ir & Coal Trds Rev—Feb. 9, 1906. No. 75222 A.

Malleable Cast Iron, Its Manufacture and Its Physical Properties. G. A. Akerlind. Read at meeting of the Scandinavian Tech. Soc. A discussion of the manufacture and properties of this material. 4000 w. R R Gaz—June 8, 1906. No. 77231.

## Chains.

Chain Making: Its History and Development. Andre Jockaru. Illustrated description of the Lelong chain machine, the latest device for rapid production. 4800 w. Ir Trd Rev—May 3, 1906. No. 76487.

Chain-Making Machinery. Emile Lelong. Illustrates and describes the Lelong chain-making machine and its operation, with remarks on the advantages and on other processes. 2000 w. Ir & St Inst—May, 1906. No. 76918 N.

## Chemistry.

Chemistry in Foundry Operation (Die Chemie im Giessereibetriebe). C. Henning. An address showing the value of applied chemistry in connection with daily foundry work. Serial. Part I. Stahl u Eisen—Nov. 1, 1905. No. 73371 D.

## Chuck.

A Simple Magnetic Chuck. R. V. C.

# MECHANICAL ENGINEERING

## Cold Working

Brook. An illustrated description of a chuck designed to hold irregular castings and forgings such as milling cutters, dies, punches, etc., which had to be ground on their faces and could not be conveniently held in an ordinary chuck. 500 w. Mech Engr—July 14, 1906. No. 78210 A.

## Cold Working.

Practical Notes on Wire Drawing and Cold Rolling (Aus des Praxis der Eisen Zieherei und Kaltwalzerei). Ernst Rolf. Data concerning the behaviour of annealed and unannealed metal in wire-drawing and other cold-working processes. 1800 w. Stahl u Eisen—March 15, 1906. No. 76227 D.

## Compass.

The Compass Machine. C. H. Claudy. Illustrated description of the machine used for cutting compass cards. 1000 w. Am Mach—Vol. 29. No. 27. No. 77808.

## Cores.

Venting Difficult Cores. Walter J. May. Suggestions for making vents or gas passages in unusual shapes. Ills. 600 w. Prac Engr—Nov. 3, 1905. No. 73125 A.

Core Sands and Core Binders. E. D. Frohman. Read before the Cleveland Foundry Foremen. Discusses the question of sands and of core compounds, giving a report of tests and showing that the amount of loam in the sand determines what core binder must be used. 2000 w. Foundry—June, 1906. No. 77320

Multiple Core Molding. H. J. McCaslin. Describes this method of core making, which is especially adapted to small castings. Ills. 1500 w. Foundry—June, 1906. No. 77321.

Core Oil and Oil Cores. W. P. Henemann. An illustrated article discussing the making of cores. Foundry—March, 1906. No. 75422.

Principles and Practice of Coremaking. Robert Buchanan. Abstract of a paper read before the Staffordshire Iron & Steel Inst. Discussing core boxes, cores, and core-making, rods, venting, drying, loam cores, etc. 4500 w. Ir & Coal Trds Rev—March 9, 1906. No. 75595 A.

## Core-Boxes.

Multiple Core-Boxes. H. W. Tuttle. Describes the making of these boxes. Ills. 1000 w. Foundry—Feb, 1906. No. 75203.

## Core-Making.

Mechanical Core-Making Machines. Illustrates and describes a variety of these machines. 2500 w. Ir & Coal Trds Rev—May 11, 1906. No. 76926 A.

## MACHINE WORKS AND FOUNDRIES

## Crossheads

## Corrosion.

Oil Corrosion in Cylinders. Harry Spurrier. An account of the writer's experience and the remedy applied. 1200 w. Power—July, 1906. No. 77519 C.

## Cost-Estimates.

The Insulating Cost in the Manufacture of Dynamo-Electric Machinery. H. M. Hobart. An investigation of the cost of the labor and material entering into the insulating of dynamo-electric machinery. 2200 w. Elec Engr, Lond—Feb. 16, 1906. No. 75272 A.

## Cost Keeping.

The Cost-Stores System of a Modern Boiler-Manufacturing Plant. H. S. Knowlton. Describing the forms, methods, and practice of the Robb-Mumford Company. 3500 w. Engineering Magazine—Oct., 1906. No. 79385 B.

## Costs.

Foundry Costs. Ellsworth M. Taylor. Read at the A. F. A. convention. The importance of accurate cost methods are set forth, and an outline given, covering in a general way the vital points in regard to foundries. 3500 w. Foundry—Jan, 1906. No. 74557.

## Cranes.

Derrick Cranes at the Berlin-Anhalt Machine Works, Berlin (Die Masten-krananlage der Berlin-Anhaltischen Maschinenbau A. G. Berlin). K. Specht. Showing an arrangement of four electrically driven derrick cranes covering the entire yard of the works. Structural details are given. 1800 w. Zeitschr d Ver Deutscher Ing—Sept. 8, 1906. No. 79311 D.

The Electric Crane in the Foundry. Harry Sawyer. Read at Cleveland meeting of the Am. Found. Assn. Remarks on the requirements of these cranes, the conditions under which they are operated, high speeds, control, etc. 2000 w. Ir Trd Rev—June 14, 1906. No. 77274.

See Mechanical Engineering, Power and Transmission.

## Crank Shafts.

The Manufacture of Crank Shafts (Die Herstellung Gekröpfter Wellen). Fr. Schraml. Describing the methods and special tools for machining multiple crank shafts from solid steel forgings. 2500 w. Zeitschr d Ver Deutscher Ing—July 7, 1906. No. 78113 D.

## Crossheads.

Making Interchangeable Crossheads, Bodies and Slippers. J. C. Dufresne. Illustrated description. 900 w. Am Mach—Vol. 29. No. 7. No. 75014.

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## Crushing Mills

## MACHINE WORKS AND FOUNDRIES

## Drawing Office

### Crushing Mills.

Sugar-Cane Crushing Mill. An illustrated detailed description of a fine example of this class of machinery built for British Guiana. 2000 w. Engr, Lond—Jan. 12, 1906. No. 74527 A.

### Cupolas.

Distribution of Blast in Modern Cupola Practice. William H. Coleman. Aims to show the effects of high and low pressures on the melting capacities of cupolas, and on the cupola itself, as well as on the product. 1500 w. Ir. Trd Rev—March 29, 1906. 75838.

Recent Examples of Cupola Construction. (Neue Kupolofenanlage). Fr. Greiner. With plans and elevations of cupola construction in recent German foundries, including data as to methods of operation, and performance. 4000 w. Stahl u Eisen—April 1, 1906. No. 76232 D.

### Cutters.

Milling Cutters. An illustrated article considering types of plain milling cutters and of side milling cutters. 2500 w. Mach, N Y—April, 1906. No. 75878 C.

### Cutting-Off.

An Analysis of the Cutting-Off Machine. Frederic R. Honey. An examination of the mechanism of the Pratt & Whitney cutting-off machine. 1500 w. Am Mach—Vol. 20. No. 19. No. 76609.

### Cylinders.

Molding Automobile Engine Cylinders. L. N. Perrault. Illustrates and describes the process as followed in the manufacturers' foundry at Waterbury, Conn. 3300 w. Ir Age—Sept. 13, 1906. No. 79151.

The Design and Construction of Cylinders. H. S. Brown. Discusses conditions affecting the truth of cylinders. 2000 w. Am Mach—Vol. 29. No. 36. No. 78973.

### Design.

Essentials in Engineering Design. A. T. J. Kersey. Discusses the essential features of a good design and the qualifications a young engineer should possess to produce designs satisfactory to the works manager. 1800 w. Mech Engr—June 30, 1906. No. 77876 A.

### Dies.

Folding or Bending Dies. Carroll Ashley. Illustrates and describes dies which will not stretch or distort the metal. 1000 w. Am Mach—Vol. 28, No. 49. No. 73646.

Punch and Die Work. E. R. Markham. An illustrated article describing methods

used in this work, and the different operations. 3300 w. Mach, N Y—July, 1906. Serial. 1st part. No. 77707 C.

Making a Blanking Die. C. F. Emerson. Names the essential things to be considered in making blanking dies, and the method of making them. Ills. 1200 w. Mach, N Y—June, 1906. No. 77099 C.

Spring Screw Threading Dies. Erik Oberg. Considers the requirements for a threading die and how to obtain them, outlining the system of manufacture. 2000 w. Mach, N Y—Aug., 1906. No. 78332 C.

Blanking and Piercing Dies for Washers. C. F. Emerson. Diagrams and suggestions for the making of such dies. 1600 w. Mach, N. Y.—Oct., 1906. No. 79613 C.

The Manufacture of an Opening Die by Means of Various Labor-Saving Devices. Illustrated description of methods and tools used in making the Ideal opening die. 1600 w. Am Mach—Vol. 29. No. 40. No. 79616.

### Drafting.

Shop Hints for Structural Draftsmen. John C. Moses. The present article considers the templet shop and discusses the possible saving of expense. Ills. 3000 w. Eng News—March 22, 1906. Serial, 1st part. No. 75649.

Economical Equipment and Management of the Drafting Room. T. D. Perry. Discussing especially systematic methods of storing and filing records, data, and drawings. 3000 w. Engineering Magazine—June, 1906. No. 76875 B.

### Drafting Rooms.

A Drafting Office System. A. Jacobs. Explains a system which it is believed may be used as a basis for a system to meet any requirements. 2000 w. Am Mach—Vol. 29. No. 26. No. 77527.

### Draftsmen.

The Question of Men and Salaries in the Drafting Room. George F. Summers. A statement of existing conditions, considering the value of a draftsman, the pay, etc. 1400 w. Am Mach—Vol. 29. No. 22. No. 77059.

### Drawing Office.

Tracing, Lettering and Mounting. I. G. Bayley. This first of a series of articles deals especially with the essential materials of a drawing office, and directions for tracing. 2500 w. Mach, N Y—Sept., 1906. Serial. 1st part. No. 78964 C.

The Organization of a Drawing Office. W. O. Horsnail. Describes a system ap-



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## Drawing Presses

plicable to drawing-offices dealing with all kinds of engineering work. Ills. 2500 w. Engr, Lond—Dec. 1, 1905. Serial. 1st part. No. 73692 A.

## Drawing Presses.

Progress in the Construction of Drawing Presses (Fortschritte im Räderzieh-presenbau). Karl Musiol. An examination of cam roller drawing presses, showing the influence of the elasticity of the machine parts upon its action. Serial, Part I. 2500 w. Stahl u Eisen—March 1, 1906. No. 75744 D.

## Drawings.

The Reproduction of Drawings of Great Length or Number. L. F. Rondinella. A review of the methods for making long prints, giving illustrated descriptions of several continuous-printing machines and their working. Also general discussion. 5800 w. Pro Engrs' Club of Phila—Oct., 1905. No. 73938 D.

## Drill Chuck.

The Making of a Drill Chuck. Remarks on the aims and methods of the inventor, describing the operations covering the manufacture. Ills. 2500 w. Am Mach—Vol. 29. No. 42. No. 79829.

## Drilling Machine.

Horizontal Drilling and Boring Machine. Illustrated description of a fine machine tool recently built in England. 700 w. Engr, Lond—Jan. 5, 1906. No. 74424 A.

## Drills.

Six-Spindle Special Driller. Illustrated description of a machine built for drilling the spanner holes in small hardware and machine parts all at one operation. 600 w. Am Mach—Vol. 28. No. 46. No. 73215.

Design for Sliding Head for Upright Drill. H. F. Noyes. Illustrates and describes this device and its construction; the novel features are in the power feed and the automatic stop. 800 w. Am Mach—Vol. 29. No. 7. No. 75011.

## Drums.

Making Countershaft Drums at the Works of the Landis Tool Company. H. F. Noyes. Illustrated detailed description. 800 w. Am Mach—Vol. 29. No. 8. No. 75235.

## Electrical Works.

The East Pilton Works of Messrs. Bruce Peebles & Co., Ltd. Illustrated description of the largest works for making electrical machinery in Scotland, at Edinburgh. 1800 w. Elec Rev, Lond—Nov. 17, 1905. Serial. 1st part. No. 73458 A.

## MACHINE WORKS AND FOUNDRIES

## Electric Driving

### Electric Driving.

The Applications of Electricity in the Royal Gun Factory, Woolwich Arsenal. Col. H. C. L. Holden. Read before the Inst. of Elec. Engrs. Illustrates and describes applications of electricity and the methods, some of which are a departure from ordinary practice. 3000 w. Elec Engrs, Lond—Nov. 24, 1905. Serial. 1st part. No. 73592 A.

Motor-Drive and Machine Shop Economy. E. R. Douglas. Reviews the development of motor-driving in machine shops, stating the advantages, and the systems of speed control that have been commercially successful. 4000 w. Elec Rev, N Y—Feb. 10, 1906. No. 74963.

Power Required by Machine Tools, with Special Reference to Individual Motor Drive. G. M. Campbell. Presents deductions from the various motor equipments in a modern shop, giving curves of power and examples of every day practice; also discussion. 5800 w. Pro Engrs' Soc of W Penn—Feb, 1906. No. 75090 D.

Electric Driving in Shipyards. Illustrates and describes interesting installations at Sunderland, England, for driving machine tools. 1600 w. Engr, Lond—March 2, 1906. No. 75514 A.

Electricity in the Foundry. H. S. Knowlton. An illustrated article calling attention to the variety of uses to which electricity has been applied in the foundry. 1500 w. Cassier's Mag—March, 1906. No. 75609 B.

Some Notes on Motor Driving. W. J. Belsey. Describes some novel applications of motor driving and considers the type of motor most suitable for the operation of various machines. Ills. 3000 w. Elec Engr, Lond—Feb. 23, 1906. Serial, 1st part. No. 75369 A.

Electric Power Transmission. E. J. Erskine. Read before the Engng. Assn. of N. S. W. On the advantages to be gained by electric driving both in small shops and large establishments, some points to be considered in the installation, etc. 2700 w. Aust Min Stand—May 16, 1906. No. 77469 B.

The Electrical Equipment of the Olds Gas Power Company, Lansing, Michigan. Description of a factory where they utilize the power developed in the testing department. 2200 w. Am Mach—Vol. 29. No. 24. No. 77276.

First Electric Motor-Driven Rail Mill. Illustrated description of the equipment of the Edgar-Thomson plant at Bessemer, Pa. 1500 w. Ind Wld—July 7, 1906. No. 77824.

# MECHANICAL ENGINEERING

## Electric Works

Tests of Electrically-Driven Planers. George H. Schaeffer and Charles E. Butz. A report of tests made to get the variation of power required at different points in the motion of the table. 1000 w. Elec Wld—Aug. 25, 1906. No. 78866.

The Power Plant of the Sherman Envelope Company, Worcester. Howard S. Knowlton. Illustrates and describes a factory equipped with individual motor drive on a large scale. The heating, lighting and other mechanical plant are described. 2500 w. Engr, U S A—Aug. 1, 1906. No. 78372 C.

Electricity in Iron Works (Die Elektrizität im Huttenwesen). Hans Koch. A study of the generation and utilization of electricity in handling materials at the furnaces, driving rolls, etc., and in the general distribution and applications of power in iron and steel works. Serial. Part I. 2500 w. Aug. 18, 1906. No. 79338 D.

See also Mining and Metallurgy, Iron and Steel.

## Electric Works.

The Western Electric Company, North Woolwich. An illustrated description of this English branch of this large manufacturing industry. 2500 w. Elec Engr, Lond—May 25, 1906. No. 77126 A.

The Electrical Works of the Allis-Chalmers Company. Illustrated description of works located at Norwood, a suburb of Cincinnati, Ohio. 1800 w. Elec Rev, N Y—July 7, 1906. No. 77832.

## Engraving.

A New Machine for Engraving Steel Plates. A. Frederick Collins. Illustrates and describes a machine invented by William S. Eaton, which is said to do the work better and cheaper than a skilled engraver. 1500 w. Sci Am—May 19, 1906. No. 76686.

## Exposition.

See Industrial Economy.

## Facings.

Foundry Facings. W. G. Scott. Read before the A. F. A. Convention. Describes the different grades of material, and gives a suitable method for testing the quality. 4500 w. Foundry—Dec., 1905. No. 73946.

## Factories.

The Iron-Clad Manufacturing Company. An illustrated article describing the facilities for the welfare of employees, and some interesting things from a mechanical standpoint of this factory in Brooklyn. 3700 w. Am Mach—Vol. 29. No. 30. No. 78230.

## MACHINE WORKS AND FOUNDRIES

## Forging Press

## Factory Equipment.

The New Mechanical Equipment at the Joseph Campbell Factory, Camden, N. J. Describes a factory for the manufacturers of food stuffs, said to be a model in mechanical equipment, cleanliness, and the elimination of manual handling of all materials. Ills. 3500 w. Eng Rec—April 21, 1906. No. 76328.

## Fan-Blowers.

The Conditions of Fan-Blower Design. Walter B. Snow. An explanation of the forces to be considered in the design of various types. 2500 w. Cassier's Mag—Jan., 1906. No. 74463 B.

## Files.

Files and File Testing. Edward G. Herbert. An investigation of files and factors governing their efficiency. 4000 w. Am Mach—Vol. 29. No. 7. No. 75010.

## Fire Arms.

The Manufacture of Colt's Automatic Army Pistol. An illustrated description of some of the interesting machine operations, and the machines used. 1700 w. Mach, N Y—May, 1906. No. 76464 C.

## Fitting.

How Brasses Are Fitted. T. E. O'Donnell. Illustrates and describes the methods employed after lining up an engine. 2000 w. Engr, U S A—Sept. 15, 1906. No. 79293 C.

## Flanges.

Flange Fittings. Edward Sette. Brief illustrated description of half-flange fittings with stuffing box and gland to fit standard pipe flanges. 400 w. Ice & Refriger—Aug., 1906. No. 78390 C.

## Flux.

Fluor Spar as a Flux. Letters for and against the use of fluor spar. 1200 w. Foundry—Oct., 1906. No. 79742.

## Forgings.

The Manufacture of Forgings. Frank Somers. Read before the Staffordshire Iron & Steel Inst. A review of the tools used to save human labor in the manufacture of iron forgings from the earliest invention to the present. 2500 w. Ir & St Trds Jour—Dec. 16, 1905. No. 73990 A.

Forging at the Collinwood Shops. Gives photographs of some of the articles which are being made in these shops of the L. S. & M. S. R. R., with descriptive notes. 1300 w. Am Engr & R R Jour—April, 1906. No. 75852 C.

## Forging Press.

Forging Presses. Illustrates a model of 3000-ton forging press, and describes

# MECHANICAL ENGINEERING

## Foundries

## MACHINE WORKS AND FOUNDRIES

## Foundries

the work done, and the improvements recently introduced. 3000 w. Engr, Lond—April 27, 1906. No. 76580 A.

Combined Steam and Hydraulic Forging Press. An illustrated article discussing the construction of the press, the method of driving, and the work to be done under the press and cost of production. 2000 w. Prac Engr—Aug. 10, 1906. Serial. 1st part. No. 78660 A.

## Foundries.

Fireclays and Molding Sands. Percy Longmuir. Read before the British Found. Assn. Discusses the three classes of refractory materials, both furnace materials and molding sands. 4000 w. Ir & Coal Trds Rev—Jan. 12, 1906. No. 74529 A.

Heating and Ventilation of Foundries. Harry Malone. Briefly considers different systems of heating, with remarks on the difficulties peculiar to the work. 1000 w. Foundry—Jan. 1906. No. 74560.

The Foundry on a Chemical Basis. Reginald Meeks. Considers how to use a chemist to advantage, specifications for ordinary foundry iron, sampling, figuring the mixture, the chemists' report, steels, etc. 4000 w. Ir Age—Jan. 4, 1906. No. 74218.

Foundry Blackings and Partings. E. L. Rhead. Discusses in detail the various substances used for blacking the surface of molds. 3500 w. Mech Engr—Jan. 20, 1906. No. 75015 A.

Foundry Practice. William A. Bole. Read before the Pittsburg Found. Assn. Discusses the qualities of pig iron, molten irons, charcoal irons, scrap, etc., the requirements of castings, their composition and related subjects of interest. 5000 w. Ir Age—Feb. 15, 1906. No. 75004.

Foundry Problems. Dr. Richard Moldenke. Address to the Pittsburg Found. Assn. Discusses problems for improving the quality of the castings. 2000 w. Ir Trd Rev—Feb. 15, 1906. No. 75009.

Notes on American Foundry Operation (Betrachtungen über den Amerikanischen Giessereibetrieb). B. Osann. A review of a visit to the United States with especial reference to the operation of the iron and steel foundries of the larger American shops. Two articles. 4000 w. Stahl u Eisen—Jan. 15, Feb. 1, 1906. No. 75137 each D.

A Modern Steel Foundry of the Square Type. Illustrated description of the Baldt Steel Co.'s foundry, at New Castle, Del. 2000 w. Ir Age—April 5, 1906. No. 75918.

Foundry Costs. R. W. McDowell. Describes a system intended to meet the

requirements of the general foundry, giving forms used for reports. 5500 w. Ir Trd Rev—April 5, 1906. No. 75941.

Modern Foundry Construction. David Townsend. Read before the Philadelphia Foundry Foremen. Considers the essentials of a thoroughly modern shop. 1700 w. Ir Trd Rev—April 12, 1906. No. 76045.

South Altoona Foundries. Begins an illustrated description of the extensive new plant at South Altoona. The present article describes the wheel foundry. 2500 w. Am Engr & R R Jour—April, 1906. Serial. 1st part. No. 75849 C.

The Manufacturers' Foundry Co., Waterbury, Conn. Illustrates and describes a plant for the manufacture of intricate castings. 1800 w. Ir Trd Rev—April 19, 1906. No. 76145.

A Modern Foundry Plant (Eine Moderne Giessereianlage). G. Rietkötter. A detailed description of an enlarged and rebuilt foundry plant, representing modern German practice, with plans and elevations of the buildings, and photographs of interior. Serial. Part I. 3500 w. 2 plates. Stahl u Eisen—May 1, 1906. No. 76811 D.

Foundry Costs. R. W. McDowell. Describes a cost system intended to meet the requirements of the general foundry. 5500 w. Foundry—May, 1906. No. 76708.

Foundry Department of the Ingersoll-Rand Co., Phillipsburg, N. J. Illustrated description of a plant for constructing a varied line of castings. 1700 w. Foundry—May, 1906. No. 76707.

Pipe Founding in Canada. Illustrated detailed description of the plant of the Montreal Pipe Foundry Co., Ltd., at Three Rivers, Province of Quebec, and the mode of manufacture. 3000 w. Can Engr—May, 1906. No. 76625.

Foundry Costs. An investigation made by the Worcester Polytechnic Institute is reported. Shows the difference when apportioning burden per molder's day, instead of per pound of product. 1500 w. Ir Age—Aug. 23, 1906. No. 78683.

The Manufacturers Foundry Co., Waterbury, Conn. Illustrated description of a foundry devoted exclusively to work of unusual difficulty. 1800 w. Foundry—Aug., 1906. No. 78595.

Tendencies in the Foundry Industry. Dr. Richard Moldenke. Read before the New England Foundrymen's Assn. Considers the tendency toward multiple operations, sand treatment, standardizing, steel scrap, ferro alloys, the electric fur-

# MECHANICAL ENGINEERING

## Foundries

nace, and the direct metal process. 3800 w. *Ir Age*—Dec. 21, 1905. No. 73941.

A Puzzling Bit of Foundry Work. C. Metcalf. An illustrated description of the making of a double-grooved drum, at iron works in South Brooklyn. 1000 w. *Sci Am*—March 31, 1906. No. 75827.

Foundry Practice. William A. Bole. Abstract of a paper read before the Pittsburgh Found. Assn. Discusses the use of scrap requirements of castings, bad castings, flasks and outfit. 5500 w. *Foundry*—March, 1906. No. 75421.

Dark Secrets in Foundry Practice. William H. Parry. Read at meeting of Am. Found. Assn. Refers to prevalent practices which are guarded as secrets which are of little value. 1200 w. *Ir Trd Rev*—July 26, 1906. No. 78261.

The Influence of Different Ore Mixtures on the Resultant Pig Iron from the Standpoint of the Foundry. W. A. Barrows, Jr. Read at the A. F. A. Convention. Gives reasons for some irons failing and some proving satisfactory. 2500 w. *Foundry*—Sept., 1906. No. 79277.

The Steel Foundry Co., Cincinnati, O. Illustrated description of a new plant near Ivorydale, and its equipment. 1000 w. *Foundry*—Oct., 1906. No. 79739.

## Founding.

Motor Car Cylinder Founding. Hugh Dolnar. Illustrates and describes the work as carried out at the Reedy foundry, Chicago, in the present number. 2200 w. *Am Mach*—Vol. 29, No. 31. Serial. 1st part. No. 78366.

## Furnaces.

Tube Welding Furnaces (Die Gasrohrschweissofen). Anton Bousse. With illustrations of reverberatory furnaces for the heating of tubes prior to lap-welding. Serial. Part I. 3000 w. *Stahl u Eisen*—May 15, 1906. No. 76814 D.

The Scientific Control of the Operation of Industrial Furnaces (Le Contrôle Scientifique de la Marche des Fours Industriel). H. le Chatelier. An address before the students of the University of Liège, discussing the extent to which the measurement of temperatures, analyses of gases, and scientific observations, enables close control to be secured. 10000 w. *Revue de Métallurgie*—June, 1906. No. 77671 H.

Heating and Tempering Furnace with Electrically Heated Molten Bath (Glüh und Härteöfen mit Elektrisch Geheiztem Schmelzbad). L. M. Cohn. Illustrating an electric tempering furnace for the precise maintenance of predetermined defi-

## MACHINE WORKS AND FOUNDRIES

nite temperatures. 4000 w. *Elektrotech Zeitschr*—Aug. 2, 1906. No. 78754 B.

The Reverberatory Furnace in American Foundries (Der Flammofenbetrieb in Amerikanischen Giessereien). V. Portisch. With plans and details of furnaces of various design and capacity as actually used in American foundries. 2500 w. *Stahl u Eisen*—Oct. 1, 1906. No. 79940 D.

## Galvanizing.

The Galvanizing of Iron and Steel Surfaces. Sherard Cowper-Coles. Illustrates and describes the hot galvanizing process, and the electro or cold galvanizing process, giving related information. 4800 w. *Ir & Coal Trds Rev*—Nov. 10, 1905. No. 73427 A.

Galvanizing. Dr. R. Moldenke. Gives an outline of the galvanizing process as now carried on. 1500 w. *Foundry*—Jan. 1906. No. 74558.

## Gate Valves.

Some Large Gate Valves. Illustrates and describes the construction of some gate valves of 9 ft. water-way, for the Niagara Power Co. 1200 w. *Am Mach*—Vol. 29, No. 5. No. 74817.

## Gauges.

Notes on Gauges and Measuring Appliances (Note sur quelques Jauges et Calibres). G. Richard. With illustrations of a variety of micrometer and vernier calipers, and a discussion of precise measurements in the shop. 6000 w. *Revue de Mécanique*—Aug. 31, 1906. No. 79920 E+F.

## Gear Cutters.

The Gleason Bevel Gear Generator. Illustrates and describes an ingenious machine for the cutting of bevel gears, and explains the object sought by the combination of movements. 2500 w. *Ir Age*—June 21, 1906. No. 77404.

The Bevel-Gear Cutting Machine of Ducommun at Mulhouse in Alsace (Die Kegelrad hobelmaschine der Werkstätte für Maschinenbau un vorm. Ducommun in Mülhausen). Hermann Fischer. Describing a bevel-gear cutting machine on the Bilgram principle, developing the theoretical form of tooth as it is cut. 1500 w. *Zeitschr d Ver Deutscher Ing*—March 10, 1906. No. 75710 D.

## Grading.

Grading Pig Iron for the Foundry. P. Munnoch. Read before the British Found. Assn. Discusses grading by fracture and by analysis, and proposes a system of buying by grade and silicon. 3000 w. *Ir Trd Rev*—Oct. 25, 1906. No. 80104.

# MECHANICAL ENGINEERING

## Graduating

### Graduating.

Graduating Range Dials for Navy Guns. J. J. Strong. Describes the method used in the shop of the Washington Navy Yard. Ills. 800 w. Am Mach—Vol. 29. No. 40. No. 79614.

### Grinder.

Mayer's Twist Drill Grinder. Illustrated description of a machine for automatically grinding twist drills recently devised by G. M. Meyer, of Germany. 1100 w. Mech Eng—Oct. 28, 1905. No. 72996 A.

### Grinding.

The Grinding of Accurate Duplicate Tool Steel Parts. Joseph V. Woodworth. Illustrates and describes fixtures used to assist in the cheap production of interchangeable parts of tool steel. 1000 w. Ir Trd Rev—May 3, 1906. No. 76488.

The Cost of Grinding. H. F. Noyes. How to determine the cost of commercial wet grinding is discussed. 1000 w. Mach, N Y—Oct., 1906. No. 79612 C.

Earlier and Modern Wet-Grinding Machines and Practice. H. F. Noyes. A discussion of the grinding machine, considered as a cutting tool, showing the progress in design, scope, and performance. 3000 w. Engineering Magazine—July, 1906. No. 77682 B.

Grinding Machines for Large Ball Races. Illustrated description of a machine for grinding large ball races and rings used on pedestal gun mounts. 1200 w. Am Mach—Vol. 29. No. 22. No. 77058.

Modern Grinding. Joseph Horner. Comments on the advances made in precision grinding, and illustrates and describes types of grinding machines. 2800 w. Cassier's Mag—June, 1906. No. 77295 B.

Recent Grinding Machines for Tools (Neuere Schleifmaschinen für Werkzeuge). G. Schlesinger. Illustrating improved machines for sharpening saws, twist drills, milling cutters, etc. 2000 w. 1 plate. Zeitsch d Ver Deutscher Ing—June 30, 1906. No. 78107 D.

A Design for a Headstock for a Grinding Machine. H. F. Noyes. Gives description, with sections and elevation, stating the conditions it was designed to meet. 1000 w. Am Mach—Vol. 29. No. 31. No. 78371.

An English Special Rod-Grinding Machine. I. W. Chubb. Illustrated detailed description of a machine for grinding straight circular rods up to about 0.8 inches diameter. The work is explained. 1800 w. Am Mach—Vol. 29. No. 34. No. 78684.

## MACHINE WORKS AND FOUNDRIES

## Hoisting

Selection and Use of Grinding Wheels. H. Darbyshire. Discusses the selection of wheels for a given material and shape of work and points relating to the use of the wheels. 3000 w. Am Mach—Vol. 29. No. 36. No. 78970.

### Hacksaws.

Testing Hacksaws. H. L. Whittemore. An account of the methods used in making the test, with diagrams. 1300 w. Am Mach—Vol. 29, No. 17. No. 76332.

### Hammers.

Experiments with Pneumatic Hammers (Untersuchungen an Druckluft hammers). P. Möller. Experimental investigations into the efficiency of pneumatic tools of the rapid hammer-blow type. 6000 w. Zeitschr d Ver Deutscher Ing—July 21, 1906. No. 78705 D.

### Hardening.

Methods and Precautions in Hardening Steel (Ueber Verschiedene Vorsichten und Kunstgriffe beim Härten des Stahles). Prof. F. Kick. A discussion of experimental investigations into the best methods of hardening steels, showing the importance of entrusting this work to a special scientific department for the entire shop. 2500 w. Oesterr Zeitschr f Berg u Hüttenwesen—Sept. 1, 1906. No. 79948 D.

### Headstocks.

A Study in All-Gear Heads. Thomas R. Shaw. Explains the meaning of the term "all-gear," and gives illustrated descriptions of types. 2000 w. Mech Engr—July 14, 1906. Serial. 1st part. No. 78208 A.

The Design of an All Gear Headstock. H. T. Millar. Gives drawings explaining the construction suitable for a headstock of 8-inch centers (16-inch swing) or thereabouts, showing the motion. 900 w. Am Mach—Vol. 29. No. 23. No. 78578.

### High-Speed Tools.

High-Speed Tools for Rapid Work in Turning Locomotive Driving-Wheel Tires. Illustrates and describes a 90-in. driving-wheel lathe and special tools of high-speed air-hardening steel. 600 w. Eng News—Sept. 13, 1906. No. 79173.

### Hoisting.

Hoisting and Special Machinery for Iron Works (Hebezeuge und Spezialmaschinen für Hüttenwerke). Illustrations of locomotive, traveling, and gantry cranes, also traveling ladles, and special modern handling appliances. Serial. Part I. 3000 w. Stahl u Eisen—Aug. 1, 1906. No. 78734 D.

# MECHANICAL ENGINEERING

## Hooks

## MACHINE WORKS AND FOUNDRIES

## Lathe

### Hooks.

The Theory of Hooks. Walter Rautenstrauch. Gives the theory recently developed by Mr. E. S. Andrews and Prof. Karl Pearson, and extracts from experiments conducted to prove it. Ills. 1500 w. Sib Jour of Engng—Oct., 1905. No. 73486 C.

### Hydraulic Press.

The Seamless Pressed Steel Bathtub. An illustrated article describing the hydraulic presses employed and the processes used in heavy pressed metal work. 2500 w. Ir Age—Oct. 11, 1906. No. 79690.

### Indexing.

A Drawing Record and Indexing System. Brief description of records kept for machine tool repairs. 900 w. Am Mach—Vol. 29. No. 2. No. 74318.

### Interchangeable Parts.

Manufacturing Interchangeable Machine Parts. John H. Barr. An introductory discussion of the development of labor-saving, especially in the United States, with remarks on the advantages of interchangeable parts, and a general consideration of the methods of duplicating. 7000 w. Sib Jour of Engng—May, 1906. No. 77026 C.

### Iron Works.

Some Notes on a Visit to Iron and Steel Works in the United States and Canada. P. N. Cunningham. Deals with the transportation, handling, and assembling of material in iron and steel works, and the accessories connected with such plants. Ills. Discussion. 10600 w. Jour of W of Scotland Ir & St Inst—Nov, 1905. No. 74719 D.

### Iron Work.

Ornamental Iron Work. A topical discussion opened by W. N. Kratzer. 4000 w. Pro Engrs Soc of W Penn—May, 1906. No. 76907 D.

### Jigs.

Two V-Block Drill Jigs. A. B. Christman. Sketches and description of jigs for drilling holes in  $\frac{1}{4}$ -inch rolled shafting are given, and the method of correctly locating the drill bushings is also described. 700 w. Am Mach—Vol. 28, No. 49. No. 73647.

Shop Tools and Methods. F. J. Le Card. Illustrated description of jig work. 600 w. Am Mach—Vol. 29. No. 28. No. 77922.

A Large Boring and Drilling Jig Used at the Works of the Landis Tool Company, and Its Special Tools. H. F. Noyes. Illustrated detailed description. 800 w. Am Mach—Vol. 29. No. 31. No. 78367.

### Joints.

Design of a Riveted Joint. Franklin H. Smith. Gives formulas and explanatory notes. 1500 w. Mach, N Y—April, 1906. No. 75877 C.

Designing of Riveted Joints. Charles E. Frick. Some suggestions helpful in designing joints and testing their efficiency. 1500 w. Boiler Maker—Dec., 1905. No. 73638.

### Laboratory.

A Steel Foundry Laboratory. Arthur Simonson. Gives information concerning the requirements of such a laboratory. Ills. 1500 w. Foundry—Sept., 1906. No. 79275.

### Lathe.

The Lo-Swing Lathe. Illustrations, with description, of a novel lathe design, explaining its object. 1700 w. Am Mach—Vol. 28. No. 44. No. 72949.

Lathes for the Amateur. From the *English Mechanic and World of Science*. Considers the principal points to be settled in buying a lathe. Ills. 4000 w. Sci Am Sup—Dec. 9, 1905. No. 73634.

Large Electrically Driven Lathes. Frank C. Perkins. Illustrated descriptions of several electrically operated lathes, and the systems for working them. 2200 w. Ir Age—Jan. 4, 1906. No. 74221.

68-In. Lathe for Turning Crank-Shafts. Illustrated description of a lathe built in Russia, for turning heavy marine-engine crank-shafts for the Newsky Shipbuilding Yard, St. Petersburg. 1000 w. Engng—Feb. 16, 1906. No. 75286 A.

Electrically-Driven "All-Gear" Lathe. Illustration, with description of a lathe designed to do away entirely with the necessity for counterdrafting. There are sixteen direct spindle speeds. 800 w. Engng—May 11, 1906. No. 76763 A.

High-Speed Lathes. Illustrates and describes some special high-speed lathes for heavy bar turning and general work. 1000 w. Engr, Lond—May 11, 1906. No. 76768 A.

Large Gap Lathe. Illustrated description of a large sliding and surfacing lathe for turbine rotors and other work. 500 w. Engng—April 20, 1906. No. 76455 A.

A Huge Lathe. Illustration, with description, of a lathe weighing 240 tons recently constructed for steam turbine work for marine propulsion. 1200 w. Engr, Lond—June 1, 1906. No. 77272 A.

A Relieving Attachment for the Lathe. H. J. White. Engravings and description of a successful device for relieving

# MECHANICAL ENGINEERING

## Lathe Works

taps and cutters. 700 w. Am Mach—Vol. 29. No. 23. No. 77216.

High-Speed Turret Lathe. Illustrated description of a new machine built especially for rapidly machining cast-iron work, such as gears, pulleys, cones and similar parts up to 15 inches diameter. 1200 w. Am Mach—Vol. 29. No. 25. No. 77407.

An English Lathe-Feed Mechanism. I. W. Chubb. An improved lathe carriage longitudinal and cross-feed mechanism is illustrated and described. 700 w. Am Mach—Vol. 29. No. 31. No. 78370.

The Bogert Crank-Shaft Lathe. Hugh Dolnar. Illustrated description and explanation of the action of this tool. 2000 w. Am Mach—Vol. 29. No. 31. No. 78369.

The Engine Lathe as a Relieving Machine. F. O. Hoagland. Illustrates and describes an attachment for the 14-inch lathe and some of the work accomplished. 1200 w. Am Mach—Vol. 29. No. 34. No. 78685.

## Lathe Works.

Lang's Lathe Works at Johnstone, Scotland. J. William Chubb. Illustrated detailed description. 3200 w. Am Mach—Vol. 28. No. 44. No. 72948.

## Lifting Magnets.

Traveling Cranes with Electromagnets for Handling Bar Iron (Laufkran mit Elektromagneten zum Verladen von Stabeisen). Illustrated description of a crane by the Augsburg-Nürnberg Company, showing the use of magnets for handling rolled structural material. 1000 w. Stahl u Eisen—April 1, 1906. No. 76231 D.

## Light Machinery.

Cold Drawn and Rolled Steel in the Manufacture of Light Machinery. Fred W. McArdle. Describes the work of building adding machines, the materials used, etc. Ills. 1400 w. Am Mach—Vol. 29, No. 6. No. 74939.

## Lubrication.

Theory and Practice of Lubrication. J. W. G. Brooker. Abstract of a paper read before the Auto-Cycle Club. Considers solid and fluid friction, discussing the properties of lubricants and other related matters. 3000 w. Mech Engr—June 30, 1906. No. 77880 A.

## Machine Design.

Design and the Safety of Machinery. Edward Crowe. Abstract of a paper read before the Cleveland Inst. of Engrs. and of the discussion. Considers the influence of design on the strength and safety. 2500 w. Ir & Coal Trds Rev—Dec. 15, 1905. No. 74059 A.

## MACHINE WORKS AND FOUNDRIES

## McKenna Process

The Relation of Mechanics to Machine Construction (Die Mechanik in ihrer Bedeutung für den Maschinenbau). H. Lorenz. An address showing the great practical utility of the modern science of mechanics and kinematics in connection with the construction machines. 5000 w. Zeitschr d Ver Deutscher Ing—April 28, 1906. No. 76802 D.

The Design of a Combined Punching and Shearing Machine. Gives the specification and illustrated description of the design. 1000 w. Am Mach—Vol. 29. No. 2. No. 74319.

## Machinery Foundations.

The Anthoni-Prache Foundation System for the Prevention of Noise and Vibrations (Fondations Isolantes Anthoni-Prache). Describing a system for absorbing vibrations by the interposition of sheets of rubber between machines and foundations. 4000 w. Mem Soc Ing Civ de France—Sept., 1905. No. 73335 G.

## Machine Screws.

Report of the Committee on Standard Proportions for Machine Screws, American Society of Mechanical Engineers. Full report, with 14 tables. 3500 w. Am Soc of Mech Engrs, No 085—May, 1906. No. 76112 C.

## Machine Tools.

Machine Tools at the Liège Exposition (Die Weltausstellung in Lüttich, 1905. Die Werkzeugmaschinen). G. Schlesinger. The first of a series of fully illustrated articles showing the machine tools from various countries exhibited at Liège. Part I. 2500 w. Zeitschr d Ver Deutscher Ing—Nov. 4, 1905. No. 73306 D.

Machine Tools at the Bavarian Jubilee Exposition, Nuremberg, 1906 (Die Werkzeugmaschinen auf der Bayerischen Jubiläums-Landesausstellung, Nürnberg, 1906). G. Schlesinger. A fully illustrated report upon iron and woodworking machinery at the exposition. Serial. Part I. 1200 w. Zeitschr d Ver Deutscher Ing—Aug. 18, 1906. No. 79305 D.

## Manufacturing Plants.

Manufacturing Buildings in Cities. Walter S. Timmins. Discusses location, rents and power, forms of construction, vibration, fire proof qualities, costs of reinforced concrete, insurance on manufacturing plants, and power plants. Ills. 3800 w. Ir Age—Jan. 4, 1906. No. 74220.

## McKenna Process.

The English McKenna Process Company, Limited. Especially an illustrated description of the electrically-driven rolling mills of these works, but gives also a résumé of the treatment the rails receive.

## MECHANICAL ENGINEERING

### Melting

2800 w. Elec Engr, Lond—Oct. 5; 1906. Serial. 1st part. No. 79792 A.

### Melting.

Melting Ratio. John Doyle. Discusses satisfactory melting, not favoring the high melting ratio. 1000 w. Foundry—Feb., 1906. No. 75202.

### Metal Cleaning.

Notes on the Cleaning of Work by Means of the Electric Current. H. S. Coleman. Read before the Faraday Society. Reports experiments made, and the results, with cleaning iron and brass articles preparatory to nickel-plating them. 800 w. Electn, Lond—April 13, 1906. No. 76195 A.

### Milling.

An English Slab-Milling Machine. James Vose. Illustrated description of a special high-speed slab-milling machine, designed for milling the sides of locomotive connecting rods, etc. 1000 w. Am Mach—Vol. 29. No. 27. No. 77810.

Worm Milling. John Edgar. On methods of milling worms, the shape of cutters, etc. Ills. 1500 w. Am Mach—Vol. 29. No. 6. No. 74938.

Milling Machine Fixtures. The present article considers the milling machine vise, which has a stationary and a movable jaw, against which are placed removable jaws, held in place by means of screws. Ills. 2000 w. Mach, N Y—Nov., 1905. Serial. 1st part. No. 72940 C.

### Milling Machines.

English Beam-End Milling Machines. Illustrated description of large machines especially designed for milling the ends of beams of various sections. 900 w. Am Mach—Vol. 29. No. 2. No. 74316.

Heavy Motor-Driven Milling Machine. An exceptionally powerful motor-driven duplex milling machine is illustrated and described. Built in Philadelphia. 400 w. Engng—April 27, 1906. No. 76575 A.

### Molding.

Molding a Large Gear Wheel. Samuel Groves. An illustrated detailed description of the Groves' Portable Gear Molding Machine and its operation. 3000 w. Can Engr—Nov., 1905. No. 73051.

Molding a Three Way Cock. H. J. McCaslin. Gives method used in molding a rather difficult casting. Ills. 500 w. Foundry—Nov., 1905. No. 72919.

Molding Machine Equipment. T. E. Vanderslice. Illustrates and describes special devices for use on molding machines, their use, etc. 3800 w. Am Mach—Vol. 28. No. 45. No. 73076.

### MACHINE WORKS AND FOUNDRIES

### Molding

Molding Machine Practice. F. W. Hall, in *The Patternmaker*. Shows a special casting mounted on different types of machines, and discusses the advantages and disadvantages of one type compared with the other. 2500 w. Foundry—Nov., 1905. No. 72920.

Modern Molding Machines (Moderne Formmaschinen). H. Baur. A very fully illustrated account of the development of the modern moulding machine, with especial reference to German practice. Two articles. 5000 w. Stahl u Eisen—Nov. 15, 1905. No. 73848 each D.

Molding Machine Practice. F. W. Hall, in *The Patternmaker*. Illustrates and describes work that required the getting up of a special device. 1500 w. Foundry—Dec., 1905. No. 73945.

Molding Materials in the Foundry. E. L. Rhead. Considers the points of importance in selecting suitable materials for making molds. 3000 w. Mech Engr—Nov. 25, 1905. No. 73586 A.

Manipulation of Molding Sand. Mr. Vroman. Read before the Chicago Foundry Foremen. Discusses the manufacture and its cost, and shows that through manipulation many of the faults of molding sand can be removed. 1500 w. Foundry—Jan, 1906. No. 74559.

Permanent Molds and Carbon Cores. Henry C. Caldwell. Read before the Phila. Found. Assn. Discusses the obstacles encountered and gives a report of the experiments and final success with carbon molds and core boxes. 1600 w. Ir Age—Jan. 18, 1906. No. 74435.

Molding Tools and Appliances. E. L. Rhead. An illustrated article considering the tools generally used and which are necessary for even simple operations. 2800 w. Mech Engr—Feb. 3, 1906. No. 74983 A.

Foundry Molds and Their Production. E. L. Rhead. Considers green sand moulds, dry sand moulds, loam moulds, and moulding operations. 3500 w. Mech Engr—March 10, 1906. No. 75585 A.

Molding Sand. H. E. Field. Read before the Pittsburgh Found. Assn. Considers the materials which make a good molding sand, and the properties that are desirable. 2800 w. Ir Age—March 15, 1906. No. 75516.

The Moulding of Bulky Pieces in a Contracted Space (Knapper-Raum—Sperrige Stücke). J. Leber. Describing the molding of a large flywheel with grooves for rope driving, the run being swept up in the sand. 1800 w. Stahl u Eisen—March 1, 1906. No. 75745 D.



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## Molding

## MACHINE WORKS AND FOUNDRIES

## Patterns

Mechanical Moulding Operations in the Foundry (Le Moulage Mécanique des Pièces de Fonderie). Léon Guillet. A systematic discussion of the design and operation of moulding machines, with illustrations of machines of American, German, and French design. Serial. Part I. 3000 w. Génie Civil—May 12, 1906. No. 77613 D.

Two Ways of Molding a Heavy Gap Press Body, at the Perkins Machine Company's Iron Foundry, Warren, Mass. R. H. Palmer. Illustrated description of the methods. 2400 w. Am Mach—Vol. 29. No. 23. No. 77215.

Molding a Draw-bench Casting in a Flask, and also by Using the Floor as a Drag and Bedding, in the Pattern. R. H. Palmer. An illustrated article describing the differences in the construction of the patterns required to allow them to be molded easily in the two ways shown. 1800 w. Am Mach—Vol. 29. No. 27. No. 77809.

Molding a Heavy Balance Wheel. Illustrates and describes a method which gave good results. 800 w. Am Mach—Vol. 29. No. 28. No. 77921.

The Position of Patterns in the Molds. Walter J. May, in the *English Mechanic and World of Science*. An illustrated article giving suggestions for a number of castings. 2500 w. Sci Am Sup—July 14, 1906. No. 77931.

Sweeping Cast Steel Slag Ladle Molds. H. J. McCaslin. An illustrated article describing the work. 1000 w. Foundry—Sept., 1906. No. 79273.

Molding a Tank—A New Method. H. J. McCaslin. Illustrated description of the method. 800 w. Am Mach—Vol. 29. No. 42. No. 79828.

## Molding Machine.

The "Leeds" Hand-Press Molding-Machine. Illustrated description of the machine and method of making molds. 1200 w. Engng—Feb. 23, 1906. No. 75374 A.

Pattern Mounting on the Molding Machine. F. W. Hall. Discusses methods of mounting, illustrating by examples. 3000 w. Am Mach—Vol. 29. No. 28. No. 77920.

A Jobbing Molding Machine. Illustrated description of a new machine which belongs to the roll-over class, explaining its advantages. 1500 w. Ir Trd Rev—Sept. 13, 1906. No. 79179.

Sand Distributor and Revolving Sand Frame for Bonvillain Molding Machines. Illustrated description of these two de-

vices. 1000 w. Am Mach—Vol. 29. No. 38. No. 79295.

Modern Moulding Machinery (Moderne Giessereimaschinen). E. Baur. A fully illustrated description of the various moulding machines for different kinds of castings, as made by the Wasserralfingen Works, in Würtemberg. Two articles, 5000 w. Zeitschr d Ver Deutscher Ing—July 28, Aug. 4, 1906. No. 78708, each D.

Recent Processes in Machine Moulding Practice. Ph. Bonvillain. Reviews briefly the development of machine moulding, describing and illustrating present day practice. 3800 w. Ir & St Inst—July, 1906. No. 78349 N.

The Bonvillain Moulding System and Moulding Machines (Das Bonvillainsche Form system und seine Formmaschine). Arthur Lentz. With numerous illustrations of moulding machines operated by hydraulic pressure, adapted for a variety of work. Serial. Part I. 3000 w. Stahl u Eisen—Aug. 1, 1906. No. 78735 D.

The Bonvillain Rotative Molding Machine. Illustrates and describes an interesting machine and some of the results obtained, especially in molding castings with deep cores. 2000 w. Am Mach—Vol. 29. No. 34. No. 78686.

The Tabor Hinged Molding Machine. Illustrated description of a machine intended for the molding of patterns which have not hitherto been molded on machines. 1500 w. Am Mach—Vol. 29. No. 35. No. 78884.

## Nuts.

Making Nuts and Rings Without Waste. An illustrated article explaining the principles of the three different methods used. 1700 w. Ir Age—June 28, 1906. No. 77500.

## Object Lessons.

Fads and Fancies. W. E. Symons. A discussion of some object lessons in the mechanical department. General discussion. 10800 w. Pro W Ry Club—Oct. 17, 1905. No. 73410 C.

## Organization.

The Organization of an Engineering Works. W. O. Horsnail. Describes the shop organization, in connection with a previously described organization of the drawing-office, which will conduce to the turning out of work in the cheapest and most efficient manner. 1700 w. Engr, Lond—Jan. 26, 1906. No. 74887 A.

## Patterns.

Metal Foundry Patterns. Walter J. May. Considers when it is worth while to make metal patterns, points of importance

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## MACHINE WORKS AND FOUNDRIES

## Pistons

in making them, their advantages, cost, and related matters of interest. 3000 w. *Sci Am Sup*—Nov. 25, 1905. No. 73418.

The Care of Patterns. Robert Grimshaw. Considers the classification and storage of foundry patterns, their designation, marking, and care. 2400 w. *Ir Age*—Dec. 21, 1905. No. 73943.

Curves in Pattern-Work. From the *English Mechanic and World of Science*. An illustrated article giving suggestions for the making of curved patterns so as to diminish shrinkage and twist. 2000 w. *Sci Am Sup*—Jan. 6, 1906. No. 74196.

Patterns for Heavy Engine Bed. H. J. McCaslin. An illustrated article discussing the different ways a pattern of this nature can be constructed. 4800 w. *Foundry*—April, 1906. No. 75938.

How the Construction of a Pattern May Be Improved by Getting the Molder's Ideas upon It. J. Wilson. Gives examples of patterns that make the molding needlessly difficult and costly, that could have been designed for simpler work. Ills. 1800 w. *Am Mach*—Vol. 29. No. 35. No. 78885.

Suggestions for Pattern Makers. H. J. McCaslin. Discusses the provisions for the molding and machining of castings, the pattern and core box work, etc. 2500 w. *Foundry*—Sept., 1906. No. 79274.

## Perforating.

A Perforating Press. Explains why perforated screens are preferred to wire screens and gives illustrations and description of machine for handling plates up to 60 inches. 1200 w. *Am Mach*—Vol. 29. No. 26. No. 77526.

## Pickling.

The Injurious Effect of Acid Pickles on Steel. Prof. Charles F. Burgess. Discusses the influence which such treatment exerts on the physical properties; giving a report of investigations carried out at the University of Wisconsin. Ills. 4400 w. *Elec-Chem & Met Ind*—Jan, 1906. No. 74240 C.

Acid Dips and Pickles for Brass Castings. H. J. Hawkins. Explains the uses of several acids in the manufacture of cast brass. 1200 w. *Foundry*—Feb, 1906. No. 75206.

## Pipe Fittings.

Piping History Repeating Itself. James Acton Miller. Refers to the use of wrought pipe bends and the saving in cost and greater safety secured; also improvements in joints and other bending work. Ills. 1500 w. *Ir Age*—Jan. 18, 1906. No. 74434.

Power Required to Thread, Twist, and Split Wrought Iron and Mild Steel Pipe. I. N. Thomson. Discusses materials used, giving tabulated results of tests, the dies used, and the importance of correctly made dies, and the subject generally. 6000 w. *Am Soc of Heat & Vent Engrs*—Jan, 1906. No. 74340 C.

## Pipe Flanging.

Modern Methods of Pipe Flanging by Machinery. Luther D. Lovekin. Describes a new method claimed to possess great advantages, especially in attaching flanges to copper pipe. Ills. 2500 w. *Jour Am Soc of Nav Engrs*—Aug., 1906. No. 79482 H.

## Pipes.

Deformations from the Combined Action of Internal Pressure and Bending under Tension or Compression (Zur Einbeulung bei Innenpressung und Biegung bei Zug oder Druck). Dr. Ph. Forchheimer. A mathematical investigation of the action of external forces upon tubes subjected at the same time to internal pressure. 1200 w. *Zeitschr d Ver Deutscher Ing*—Jan. 13, 1906. No. 74613 D.

Modern Pipe Founding. H. A. Croxton. Read before the Am. Found. Assn. Remarks based on a pipe foundry with a yearly capacity of 60,000 tons, considering the choice of pig iron, flasks and cores, crane equipment, etc. 1700 w. *Ir Age*—July 19, 1906. No. 78014.

Hawser Pipe Patterns. H. J. McCaslin. Illustrates and describes these castings and their construction. 1800. *Foundry*—Aug., 1906. No. 78596.

Concerning Steel Pipe. Extracts from a paper by Frank N. Speller, published in the *Journal of the Canadian Mining Inst*. Considers the corrosion, and the threading. 2200 w. *Locomotive*—Jan. 1, 1906. No. 75537.

## Piston-Rings.

Making a Piston-Ring. Illustrates and describes the processes by which piston-rings for Napier automobile engines are finished. 700 w. *Auto Jour*—June 30, 1906. No. 77882 A.

## Pistons.

Manufacturing Steam Pistons. J. M. Menegus. Illustrates and describes tools and fixtures used in making pistons. 1000 w. *Am Mach*—Vol. 29, No. 7. No. 75012.

Experiments upon the Strength and Deflection of Pistons (Versuche zur Ermittlung der Durchbiegung und der Widerstandsfähigkeit von Scheibenkolben). C. Bach. A description of experimental apparatus for determining the actual deflection of pistons under pressure.

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1200 w. Zeitschr d Ver Deutscher Ing—  
March 10, 1906. No. 75711 D.

## Planers.

An Improved Planer Drive. W. H. Henley. Shows a new type of drive designed to largely reduce the waste of energy required. Ills. 600 w. Am Mach—Vol. 29. No. 36. No. 78972.

## Planing.

Planing a Small Machine Part. H. P. Fairfield. An illustrated article showing the planer operations as performed on a cap box. 700 w. Mach, N Y—Sept., 1906. No. 78963 C.

## Pneumatic Tools.

Applications of Pneumatic Power in the Machine Shop. R. Emerson. A well illustrated article discussing practical points in the installation, use, and care of air tools. 3000 w. Engineering Magazine.—Feb. 1906. No. 74676 B.

## Polishing.

The Use of Steel Balls in Polishing Metals in the Tumbling Barrel. Explains the theory of this use of the balls, the kind of balls and manner of using them, describing the tumbling barrel and the character of the work that may be tumbled. Ills. 1500 w. Brass Wld—Oct., 1906. No. 80066.

## Portable Tools.

Portable Electric Tools and Their Industrial Application. Andrew Stewart. Considers points in design, and discusses breast drills, large portable tools, magnetic drilling pillars, and the efficiency of small electric tools. Ills. 2400 w. Elect'n, Lond—March 30, 1906. No. 76009 A.

Portable Electric Tools and Their Industrial Application. Abstract of a paper by Andrew Stewart, read before the Glasgow Tech. Col. Sci. Soc. Discusses considerations involved in the design of such tools, and some of the types and their advantages. 3000 w. Mech Engr—May 26, 1906. No. 77131 A.

## Press Feed.

An Automatic Press Feed. George Dean. Illustrated detailed description of an automatic strip feed for press. 1200 w. Am Mach—Vol. 29. No. 18. No. 76471.

## Press Work.

Some Progress in Simple Press Work. H. J. Bachmann. An illustrated discussion of operations on the power press in the working of sheet metals. 1500 w. Mach, N Y—July, 1906. No. 77704 C.

Some Progress in Simple Press Work. H. J. Bachmann. Considers some of the simpler operations on the power press,

## MACHINE WORKS AND FOUNDRIES

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giving suggestions. 1500 w. Prac Engr—Aug. 10, 1906. No. 78659 A.

## Pressure Tanks.

The Construction of Reservoirs to Sustain High Pressures (Sur la Construction des Réservoirs à Haute Pression). H. Royer. Discussing the construction of tanks or cylinders to contain compressed air, gases under high pressure, etc.; suggesting reinforcement by wire winding. 8000 w. Revue de Mécanique—June 30, 1906. No. 78176 E + F.

## Propeller.

Machining a Propeller. W. Burns. Describes the work. 1000 w. Am Mach—Vol. 29. No. 36. No. 78969.

## Protective Devices.

Improved Protections for Grinding Wheels (Nouveaux Protecteurs pour Meules Artificielles). Henri Mamy. Discussing especially methods for the removal of dust from grinding wheels by the use of exhaust fans and flues. 1000 w. Génie Civil—Feb. 10, 1906. No. 75130 D.

## Punching.

Automatic Channel-Strip Punching-Machine. Illustration with brief description of a machine designed to punch holes at equidistant pitch in channel-shaped shrouding-rings used in a system of turbine blading. 300 w. Engng—June 29, 1906. No. 77892 A.

Automatic Multiple Punching Machine. A machine for punching the sheets and angles of structural iron work is illustrated and described. 2200 w. Am Mach—Vol. 29, No. 15. No. 76031.

## Purchasing.

The Purchase of Materials in a Large Engineering Works. E. T. White. Deals with the purchasing of such goods as the works do not themselves manufacture. 3000 w. Engng—Sept. 21, 1906. Serial. 1st part. No. 79583 A.

## Records.

Mechanical Department Records—The Graphic System. L. A. Larsen. Presents the merits of the graphic system, explaining its use. 2000 w. Am Engr & R R Jour—Dec., 1905. No. 73532 C.

## Repairs.

Designing Machinery to Facilitate Repairs. Joseph Horner. An illustrated article offering suggestions in design that will facilitate the quick removal of the parts of a machine most subject to wear, and the substitution of new parts. 3500 w. Cassier's Mag—Nov., 1905. No. 72988 B.

## Reversing Gear.

Reversing Gear for Machine Tools. Illustrated description of a design of

# MECHANICAL ENGINEERING

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reversing gear for lathes and other similar tools. 1200 w. *Mech Engr*—July 7, 1906. No. 77974 A.

## Rings.

Formulas for Constructing Rings Made from Square or Flat Iron Bent Edgewise. S. Uren. Read before the Ry. Mas. Blk-smiths Assn. Gives the formulas used by the writer which have been proved by actual practice. 900 w. *Am Mach*—Vol 29. No. 42. No. 79827.

## Rivet Heading.

A New Double-Stroke Open-Die Header. An illustrated description of a new rivet-heading machine, built in Waterbury, Conn. 2000 w. *Ir Age*—Aug. 23, 1906. No. 78682.

## Rolling Mills.

Methods of Driving Rolling Mills. (Antriebsarten von Walzenstrassen). Franz Gerkrath. A comparison of the relative advantages of steam, gas power, and electricity for driving rolling mill machinery. 3000 w. *Stah. u Eisen*—April 15, 1906. No. 76246 D.

Recent Improvements in Rolling Mills and Connections (Ueber Neuere Konstruktionen an Walzwerksantrieben und Zwischengliedern). H. Ortmann. Discussing especially the gearing and flexible coupling connections for transmitting the power to heavy rolls. 3500 w. *Stahl u Eisen*—Jan. 1, 1906. No. 74646 D.

A German Cold Rolling Mill. Illustrated description of a mill made in Düsseldorf, Germany. 1200 w. *Ir Age*—June 14, 1906. No. 77252.

## Rolls.

Roll Grinding. C. H. Norton. States facts discovered during careful investigation of grinding rolls, with discussion of the reasons for the popular belief that rolls are practically perfect. 3000 w. *Am Mach*—Vol. 29. No. 18. No. 76469.

The Design of Bending Rolls. A. L. de Leeuw. Considers rolls of the pyramid type discussing their design, and illustrating the work by a practical example. 3800 w. *Am Mach*—Vol. 29. No. 20. No. 76685.

The Design of Billet and Bar Passes. B. H. Reddy. Gives a description of a method by means of which a series of such passes may be quickly proportioned. 1400 w. *Mach, N Y*—May, 1906. No. 76462 C.

## Safety Appliances.

Safety Appliances in Cotton Mills. J. H. Crabtree. Illustrates and describes appliances for fencing necessary parts of carding-engines to prevent accidents. 2000 w. *Engng*—Aug. 3, 1906. No. 78551 A.

## MACHINE WORKS AND FOUNDRIES

## Shop Methods

## Sand.

Notes on Moulding Sands (Notes sur les Sables à Mouler). M. Vinsonneau. An exhaustive study of the constitution and properties of foundry moulding sands, with diagrams and tables for practical use in mixing. 7500 w. *Revue de Métallurgie*—April, 1906. No. 77665 H.

The Study of Moulding Sand (Die Untersuchung des Formsandes). Hugo Fürth. Brief notes on the chemical and physical properties of good moulding sand. 1500 w. *Stahl u Eisen*—Oct. 1, 1906. No. 79944 D.

## Sand Mixing.

Sand-Mixing Appliances in the Foundry. E. L. Rhead. Illustrates and describes some mechanical appliances for this work. 2000 w. *Mech Engr*—Jan. 6, 1906. No. 74401 A.

## Saw.

The Taylor-Newbold Saw. S. Newbold. Read before the Phila. Found. Assn. Illustrates and describes this tool and its operation. 2000 w. *Foundry*—Nov., 1905. No. 72918.

The Toothless Cold Saw. E. D. Sewall. Gives an experience in repairing a cross cut saw of very hard plate, with comments by Prof. Benjamin Silliman of Yale College, experiments, and applications of the method. 3000 w. *Ir Age*—Dec. 21, 1905. No. 73942.

## Screws.

Some Objections to the Commercial Fillister and Flat-Head Screws. Suggests an improvement in screws used in building machinery. 500 w. *Am Mach*—Vol. 29. No. 2. No. 74320.

Automatic Safety Attachment for Screw-Cutting. Illustrated description of an ingenious device which makes it mechanically impossible to close the clasp-nut except at the proper moment. 1000 w. *Engng*—June 8, 1906. No. 77388 A.

Report of the Committee on Standard Proportions for Machine Screws. Revised report with tables and general discussion. Ills. 9000 w. *Pro Am Soc of Mech Engrs*—Oct., 1906. No. 79855 C.

## Shears.

A German Electric Bloom Shear. Abstract of an article by A. Schwarze, in *Stahl und Eisen*. Illustrated detailed description of several arrangements. 1500 w. *Ir Age*—Feb. 15, 1906. No. 75003.

## Shop Methods.

The Relation between Design and Construction in American Workshops (Der Zusammenhang von Konstruktion und Fabrikation Amerikanischer Werkstätten). P. Schmerse. Discussing the ex-

## MECHANICAL ENGINEERING

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tent to which judicious modifications in the design of machine elements may facilitate construction in the shop. 4000 w. *Zeitschr d Ver Deutscher Ing*—Aug. 11, 1906. No. 78713 D.

New Shop Methods from the Machinist's Point of View. W. Burns. The influence of modern shop methods upon the training of the all-round mechanic, and the future of the individual workman. 2000 w. *Engineering Magazine*—April, 1906. No. 75789 B.

### Shop Practice.

Machine Shop Practice. G. M. Campbell. Discusses chiefly the equipment of the shops, indicating how much can be done in the way of cheapening the output. Also discussion. 9000 w. *Pro Engrs' Soc of W Penn*—Nov., 1905. No. 73412 D.

### Shop Specialties.

Some Specialties of a Baltimore Shop. Illustrates and describes an automatic machine for cooking and filling 40,000 cans of corn a day, rotary pressure blowers, etc. 2200 w. *Am Mach*—Vol. 29. No. 41. No. 79767.

### Shops.

The Colburn Machine Tool Company's Shop. Illustrated description of details and partial specifications. 4800 w. *Mach*, N Y—Feb, 1906. No. 74797 C.

The Works of the F. Wesel Manufacturing Company. Illustrated description of interesting works where machines and tools used by electrotypers and stereotypers, and by printers and photo-engravers are made. The individual motor drive is employed throughout. Some of the methods are also described. 2200 w. *Am Mach*—Vol. 28, No. 51. No. 73976.

A Large and Well Designed Crane Shop. Illustrated detailed description of a plant at Milwaukee, Wis. 2800 w. *Ir Trd Rev*—March 1, 1906. No. 75313.

The Shops and Some of the Methods of the Norton Grinding Company. Illustrates and describes new shops in Worcester, Mass., and the methods employed. 4200 w. *Am Mach*—Vol. 29, No. 9. No. 75301.

Osborn's File and Twist Drill Factories, at Sheffield, England. I. William Chubb. Illustrated detailed description of these plants and their equipment. 4000 w. *Am Mach*—Vol. 29. No. 14. No. 75944.

Works and Methods of Alfred Herbert, Ltd., Coventry, England. I. W. Chubb. An illustrated article giving information of interest in regard to the methods of these English tool-makers.

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3200 w. *Am Mach*—Vol. 29. No. 15. Serial. 1st part. No. 76033.

The Concrete Erecting Shop of the Ingersoll Milling Machine Company. Illustrated description of an example of reinforced-concrete construction, giving the specifications for reinforcement and other information. 1200 w. *Mach*, N Y—May 1906. No. 76461 C.

The Boiler Shop of the Titusville Iron Works. Joseph Y. Seyboldt. Illustrations with brief description. 500 w. *Boiler Maker*—May, 1906. No. 76598.

Hicks Locomotive and Car Works. Illustrated description of Chicago works for repairing cars and locomotives, building new equipment, etc. 1200 w. *R R Gaz*—July 6, 1906. No. 77815.

Shop Extensions at the Plant of the Allis-Chalmers Co., Milwaukee, Wis. Illustrated descriptions of extensive additions to increase the capacity of the plant. 2000 w. *Eng News*—July 12, 1906. No. 77924.

The Engineering Features of a Recently Completed Boiler Shop. H. S. Knowlton. Illustrated description of some of the engineering details of the new works of the Robb-Mumford Boiler Co., at South Framingham, Mass. 3500 w. *Eng Rec*—Aug. 18, 1906. No. 78637.

The Hawthorne Shops of the Western Electric Co. H. R. King. An illustrated detailed description of this large plant, near Chicago, and its equipment. Discussion. 5500 w. *Jour W Soc of Engrs*—Aug., 1906. No. 78892 D.

Lathe Works of Dean, Smith & Grace, Limited, Keighley, England. I. W. Chubb. An illustrated description of these shops and their equipment. 3000 w. *Am Mach*—Vol. 29. No. 36. No. 78968.

The Motor Workshops of Italy and the Lessons They Teach. A descriptive account, with illustrations, of notable features observed in these shops. 800 w. *Auto Jour*—Sept. 15, 1906. Serial. 1st part. No. 79435 A.

The Construction of the Lidgerwood Plant at Waverly, N. J. Describes a new plant under construction for the manufacture of hoisting engines, cableways, etc., illustrating details. 2000 w. *Eng Rec*—June 9, 1906. No. 77237.

The Light Machine Shop. Edward H. McClintock. A discussion of its proportions and equipment. 3000 w. *Mach*, N Y—June, 1906. No. 77097 C.

The Passing of the Freeland Tool Works. An illustrated review of works founded in New York in 1845 and re-

## MECHANICAL ENGINEERING

### Shrinkages

cently dismantled. 2200 w. Am Mach—Vol. 29. No. 23. No. 77214.

See also Railway Engineering, Permanent Way and Buildings.

### Shrinkages.

Graphic Representation of the Relation of Pressures and Shrinkages of Built-Up Guns for the States of Action and Rest. Louis M. Multon. Gives diagram and study, aiming to show the coordinate relation of all conditions of the parts of the gun cylinders between the states of action and rest and the limited conditions. Assists in the study of elastic strength. 7500 w. Pro U S Nav Inst—Sept., 1906. No. 79844 F.

### Slotting Machine.

Locomotive Frame-Plate Slotting Machine. Illustrated detailed description of a machine built in Leeds, Eng. 500 w. Engr, Lond—Aug. 3, 1906. No. 78555 A.

### Springs.

Formulæ for Helical Springs. A. Inokuty. Develops formulæ for helical springs made of round steel wires, of square steel wires, and steel wires of rectangular section. 1000 w. Prac Engr—Jan. 5, 1906. No. 74400 A.

### Steel Castings.

The Use of Steel Castings in Car and Truck Building. A. Stucki. Some of the desirable qualities of these castings are discussed. 800 w. R R Gaz—June 8, 1906. No. 77230.

### Steel Tubes.

The Manufacture of Weldless Steel Tubes. John David Morgan. Describes the methods of manufacture as conducted at the present time. 5500 w. (Students' Paper No. 515.) Ills. Inst of Civ Engrs. No. 73175 N.

### Stereotypes.

A New Device for the Making of Curved Stereotype Printing Plates for Newspapers. Describes the autoplate machine, and the recent Junior autoplate, for the use of offices where fewer plates are required. Ills. 1800 w. Sci Am Sup—May 26, 1906. No. 76790.

### Stock Keeping

A Stock-Keeping System for Raw and Finished Stores. F. W. Jessop. With illustrations of store rooms, and a detailed account of the method and system used by the Electric Controller and Supply Company. 3000 w. Engineering Magazine—May, 1906. No. 76275 B.

### Swaging.

A Job for the Heavy Swaging Machine. A. Smith. Illustrations showing what can be done on a heavy swaging machine

### MACHINE WORKS AND FOUNDRIES

### Tool Drives

with a description of how it is done and the swages used. 800 w. Am Mach—Vol. 29. No. 33. No. 78579.

### Tempering.

A Study of the Tempering of Steel (Etude Sur la Trempe de l'Acier). P. Lejeune. Data and results of a thermal study of the process of tempering, with diagrams giving the resulting curves. 2500 w. Revue de Métallurgie—Sept., 1906. No. 79929 H.

### Thermit.

Thermit Practice in America. E. Stütz. An account of the progress made within the past eighteen months, in the introduction in the United States of the Thermit process as applied in various engineering and mechanical arts. Ills. 5000 w. Jour Fr Inst—Oct., 1905. No. 73934 D.

### Threading Devices.

An Opening Taper-Threading Die and a Collapsing Pipe-Tap. Illustrated description of interesting devices, with explanation of their use. 1000 w. Am Mach—Vol. 29, No. 11. No. 75518.

### Thread Milling.

Cutter-Head Mechanism of the Thread-Milling Machine. A. E. Tcherniak. Outlines special problems in these machines, giving an analysis and description of their solutions. Ills. 1800 w. Am Mach—Vol. 29. No. 42. No. 79826.

### Throttle Valve.

Pattern for a Throttle Valve Body. H. J. McCaslin. Illustrates and describes the method used in constructing a pattern for a three way, 12 x 12 x 14½ in. throttle valve. 900 w. Foundry—Jan., 1906. No. 74556.

### Time Card.

A Comprehensive Time Card. E. T. Elbourne. Gives a type of card for use with mechanical recorders explaining the advantages. 1400 w. Am Mach—Vol. 29. No. 17. No. 76335.

### Time Keeping.

Estimating Time on Machine Work. J. H. Van Yox, Jr. Considers some points that may aid in estimating, suggesting methods applicable to various classes of work. 2500 w. Mach, N Y—Feb., 1906. No. 74799 C.

### Tire Turning.

Tire Turning Extraordinary. George S. Hodgins. Report of a test showing the capabilities of a new driving wheel lathe carried out at the West Albany shops of the N. Y. C. R. R. Ills. 1200 w. Ry & Loc Engng—Jan, 1906. No. 74202 C.

### Tool Drives.

Machine Tool Drives. John Edgar.

# MECHANICAL ENGINEERING

## Tools

## MACHINE WORKS AND FOUNDRIES

## Variable Speed

Considers the selection of the form the drive is to take and the amount of power, and the speeds, comparing the results of different methods. 2500 w. Mach, N. Y.—Oct., 1906. No. 79610 C.

## Tools.

Tools for Machining Segments. Edward Snyder. Illustrates and describes tools and methods used. 2000 w. Am Mach—Vol. 28, No. 52. No. 74036.

The Development of Machine Tools (Zur Entwicklungsgeschichte der Werkzeugmaschinen). Hermann Fischer. A historical review of the development of modern machine tools, with especial reference to the various forms of milling machines. 3000 w. Zeitschr d Ver Deutscher Ing—March 31, 1906. No. 76202 D.

The Thor Pneumatic Tools. Illustrates and describes improvements introduced in pneumatic drills and hammers. 1700 w. Ir Age—May 24, 1906. No. 76769.

Tools for Machining Brass Type-Wheels. Edward Snyder. Illustrates and describes tools designed for the purpose of turning the rims and finishing the holes, shoulders, and ends of the hubs of cast-brass type-wheels. 3500 w. Am Mach—Vol. 29. No. 27. No. 77811.

## Tool Works.

Worth Valley Tool Works, Keighley. Illustrated detailed description of these works which have been recently extended and rearranged. 2000 w. Engr, Lond—July 20, 1906. No. 78319 A.

## Torsion Stresses.

Torsion Stresses at Sharp Cornered Shoulders on Shafts (Die Beanspruchung auf Verdrehen an einer Uebergangsstelle mit Scharfer Abrundung). A Föppl. Showing the manner in which the cutting of a sharp shoulder on a shaft reduces the torsional resistance, and urging the use of liberal fillets. 2500 w. Zeitschr d Ver Deutscher Ing—June 30, 1906. No. 78108 D.

## Turbine Shop.

Messrs. Richardsons, Westgarth and Co.'s Steam Turbine Department. Illustrated description of this department and its equipment. 2200 w. Elec Rev, Lond—Sept. 28, 1906. No. 79693 A.

## Turning.

Note on the Turning of a Crank Shaft (Note sur le Tournage d'un Arbre Coudé). V. Marmor. A graphical study of the forces tending to produce flexure in a solid forged crank shaft during the operation of turning in the lathe. 3500 w. Revue de Mécanique—July 31, 1906. No. 79918 E+F.

## Turret Lathes.

Complete Scheme for Turret Lathe Fixture with Special Set of Tools. C. V. Raper. Gives operations and tool lists, with illustrations of the samples of finished work. 1000 w. Mach, N. Y.—March, 1906. No. 75237 C.

## Turret Machine.

The Prentice Multiple Spindle Automatic Turret-Machine. Illustrates and describes a machine for boring, turning, drilling, reaming, and threading small castings, forgings or pieces that have been finished on one end in a rod machine and require operation on the reverse end. 1200 w. Ir Age—Nov. 30, 1905. No. 73518.

## Type-Casting.

The Pearson Type Casting Machine. Illustrated description of a simple machine for composing advertising matter. 1700 w. Ir Age—Jan. 11, 1906. No. 74301.

## Upsetting.

Tube-Upsetting Machine (Röhrenstauchmaschine). Carl Wadas. Describing a hydraulic press for upsetting or thickening the walls of wrought tubing by longitudinal pressure. 1200 w. Stahl u

## Valves.

The Dyblie Reversing Valve. Illustrates and describes a reversing valve adapted to open hearth, soaking pit and similar furnace installations. 800 w. Ir Age—Feb. 22, 1906. No. 75228.

A Nine-Foot Valve. Robert Shirley. Illustrates and describes the method of making the pattern and mold for these valves. 1500 w. Foundry—March, 1906. No. 75423.

Globe Valve Standards. A. H. Nourse. Gives tables for low-pressure and heavy-pressure valves and handwheels as adopted by the large shipbuilding firms. Ills. 1500 w. Am Mach—Vol. 29. No. 13. No. 75862.

A Convenient Method of Weighing and Dismantling a Jenkins Back-Pressure Valve. W. H. Wakeman. Illustrates and describes the plan adopted by the writer. 700 w. Power—Nov., 1906. No. 80077 C.

Hot-Pouring vs. Cold-Pouring of Valves. Erwin S. Sperry. Remarks on difficulties due to the pouring temperature. Ills. 6000 w. Brass Wld—Oct., 1906. No. 80067.

## Variable Speed.

List of Cone and Gear Ratios for Variable Speed Drives. W. Owen. Gives tables, with explanation. 1200 w. Am Mach—Vol. 29. No. 17. No. 76334.

# MECHANICAL ENGINEERING

## Welding

## MATERIALS OF CONSTRUCTION

## Alloys

### Welding.

Autogenous Welding (La Soudure Autogène). Report of the Laboratory of the Conservatoire des Arts et Métiers upon the oxy-acetylene blowpipe for welding plates and structural members of iron and steel. 3000 w. *Revue Technique*—Nov. 25, 1905. No. 73838 D.

The Autogenous Welding of Metals (La Soudure Autogene des Metaux). P. Dumesnil. A study of the practical use of the oxy-hydrogen and oxy-acetylene blow pipes; with an examination of the thermal reactions, and data as to cost of operation. 6000 w. *Mem Soc Ing Civ de France*—Nov., 1905. No. 75726 G.

The Autogenous Welding of Metals (Die Autogene Schweissung der Metalle). E. Wiss. Describing the use of the oxy-hydrogen and oxy-acetylene blow-pipes for welding metallic structures. 3500 w. *Zeitschr d Ver Deutscher Ingenieure*—Jan. 13, 1906. No. 74610 D.

Thermit Welding. R. P. C. Sanderson. Reviews the history of the methods

covered in gaining success in the use of Thermit for welding locomotive frames. Also discussion. 3000 w. *Pro S & S-W Ry Club*—April 19, 1906. No. 78015 E.

### Wheels.

Processes of Car Wheel Manufacture. Brief illustrated descriptions of the processes as carried out at various foundries. 5500 w. *Ir & Coal Trds Rev*—May 11, 1906. No. 76925 A.

### Works.

The Works of the New Arrol-Johnston Car Co., Ltd., Paisley. Illustrates and describes these works in detail. They are exceptionally well equipped and have many interesting features. 2500 w. *Engng*—Dec. 22, 1905. No. 74152 A.

The Works of Ferranti Limited, Holinwood. Illustrates and describes works for the manufacture of electric meters, switch gear, instruments and transformers. 3500 w. *Engr, Lond*—Aug. 17, 1906. No. 78857 A.

### Works Management.

See *Industrial Economy*.

# MATERIALS OF CONSTRUCTION

## Abrasives.

Abrasive Materials. Joseph Hyde Pratt. Information concerning the production of abrasive materials, and their value. 2500 w. *Ind Wld*—June 28, 1906. No. 77752.

## Alloys

Ferrovanadium. Dr. Ohly. Discusses properties of some alloys in iron and steel, especially the remarkable qualities of chrome-vanadium steel in regard to strength and ductility. 2500 w. *Mines & Min*—Nov., 1905. No. 73038 C.

Magnetic Alloys. V. Quittner. Translated from *Prometheus*. Information concerning recent studies of magnetic alloys and the results. 2000 w. *Sci Am Sup*—Nov. 4, 1905. No. 72971.

Iron-Nickel-Manganese-Carbon Alloys. Abstract of the seventh report to the Alloys Research Committee on the properties of these alloys, by Dr. H. C. H. Carpenter. 2500 w. *Engr, Lond*—Nov. 24, 1905. No. 73607 A.

Seventh Report of the Alloys Research Committee: On the Properties of a Series of Iron-Nickel-Manganese-Carbon Alloys. Dr. H. C. H. Carpenter, R. A. Hadfield, and Percy Longmuir. An account of the investigations made and results obtained. Ills. 22000 w. *Inst Mech Engrs*—Nov. 17, 1905. No. 73747 D.

The Equilibrium Diagram of the Iron-

Carbon Alloys (Sur le Diagramme d'Equilibre des Alliages Fer-Carbone). Georges Charpy. A study of the cooling curves of the iron-carbon alloys, with a view to determine the law of cooling. 1800 w. *Comptes Rendus*—Dec. 4, 1905. No. 73831 D.

Alloys. Prof. A. Humboldt Sexton. The first of a series of articles aiming to give an account of the investigations that have been made and the facts discovered during the last few years, in so far as they are of importance to the maker and user of alloys. 2000 w. *Mech Engr*—Jan. 27, 1906. Serial. 1st part. No. 74872 A.

Iron-Carbon Alloys with High Percentages of Carbon. F. Wust in *Metalurgie*. Translation. An experimental study, giving analyses, micro-photographs and cooling curves and discussing results. 3000 w. *Ir & St Mag*—March, 1906. No. 75630 D.

Valuable Alloys. Translated from Krupp "*Die Legierungen*." Information concerning the constituents and properties of a number of alloys. 2700 w. *Sci Am Sup*—March 17, 1906. No. 75556.

The Equilibrium Curves of the System Iron and Carbon. Prof H. v. Jüptner. A revision of results obtained in experimental investigations, discussing the equilibrium curves. 800 w. *Ir & St Mag*—May, 1906. No. 76798 D.



# MECHANICAL ENGINEERING

## Alloys

Recent Investigations upon Industrial Alloys (Recherches Récentes Faites sur les Alliages Industriel). Léon Guillet. A review of the modern theory of solid solutions, discussing the work of recent investigators, with especial reference to the practical applications of the newer alloys in manufacturing. 12000 w. *Revue de Métallurgie*—April, 1906. No. 77664 H.

Losses in Making Alloys. Walter J. May. Calls attention to the unnecessary loss due to carelessness, giving suggestions. 800 w. *Prac Engr*—July 20, 1906. No. 78301 A.

The Physical Properties of Metallic Alloys (Physikalische Eigenschaften von Metallegierungen). Walter Rübel. A review of the modern study of alloys by the methods of metallography, showing the extent to which the properties are revealed by the appearance of the physical structure. 3500 w. *Glaser's Annalen*—July 1, 1906. No. 78144 D.

The Constitution of Iron-Carbon Alloys. Albert Sauveur. Discusses the Roberts-Austen Roozeboom diagram, explaining the curves, and giving arguments and experiments in support of the views advanced. 6500 w. *Ir & St Inst*—July, 1906. No. 78343 N.

## Alloy Steels.

Notes on Metals and Their Ferro-Alloys Used in the Manufacture of Alloy Steels. O. J. Steinhart. Abstract of a paper read before the Inst. of Min. & Met. Nickel, chrome, molybdenum, vanadium, tungsten, and titanium, cobalt, uranium, and tantalum are briefly considered. 2800 w. *Ir & Coal Trds Rev*—Jan. 26, 1906. No. 74882 A.

The Industrial Future of Special Steels. Léon Guillet. A brief review of these steels and their properties. 2400 w. *Ir & St Mag*—Feb., 1906. No. 75095 D.

The Manipulation of High-Speed Steels. W. J. Todd. Hints for the working of these steels. 1500 w. *Mach, N. Y.*—Feb., 1906. No. 74802 C.

## Amalgams.

Amalgams: Their Composition, Properties, Preparation, and Uses. From the French of Léon de Mortillet. Discusses the general properties of amalgams and applications made of them. 3500 w. *Sci Am Sup*—Dec. 23, 1905. No. 73986.

## Bauxite.

Refractory Uses of Bauxite. A. J. Aubrey. Reports some tests made with bauxite bricks and mentions their uses for open-hearth furnaces, the lining of kilns, and lead-refining furnaces. 2200 w. *Ir Trd Rev*—Feb. 1, 1906. No. 74814.

## MATERIALS OF CONSTRUCTION

## Brass

### Bending.

A New Machine for Bending Tests. E. Probst. Illustrates and describes a machine in use in the Institute for the Testing of materials, in Zürich. 1000 w. *Eng Rec*—Jan. 13, 1906. No. 74388.

### Black Finish.

Production of a Black Finish on Iron and Nickel. From the *Brass World*. Describes articles having a lustrous black finish said to be produced by a solution of nitrate of lead and nitrate of ammonia in connection with the electric current. 1400 w. *Mech Engr*—Jan. 20, 1906. No. 74734 A.

### Boiler Materials.

Materials for Boilers. J. Rowland Brown. Read before the Ohio Soc. of Mech., Elec., and Steam Engrs. An examination of specifications of materials of boilers and their requirements. 6000 w. *Engr, U S A*—Dec. 1, 1905. No. 73618 C.

Materials for Boilers. J. Rowland Brown. Read before the Ohio Soc. of Mech., Elec., and Steam Engrs. Present practice in the design of boilers is discussed, and the four classes of specifications of materials of boilers. Steel boiler plate, rivet steel, tubes, wrought steel, cast steel, and cast iron pressure parts are considered. 5500 w. *Boiler Maker*—Jan., 1906. No. 74162.

The Formation of Cracks in Boiler Plates (Die Bildung von Rissen in Kesselblechen). C. Bach. A study of the causes of cracks in boilers based upon data of the German boiler inspection associations; with illustrations and tabular results of tests. 5000 w. *Zeitschr d Ver Deutschr Ing*—Jan. 6, 1906. No. 74605 D.

## Brass.

Spring Brass and Bronze; Their Manufacture and Peculiarities. Erwin S. Sperry. An illustrated article considering the qualities necessary in a spring metal, method of making spring wire, and related matters. 4500 w. *Brass Wld*—Aug., 1906. No. 79492.

The Effect of Sulphur on Brass. Erwin S. Sperry. A report of experimental investigations with results. 900 w. *Brass Wld*—Sept., 1906. No. 79495.

A General Study of Special Brasses (Etude Générale des Laitons Speciaux). Léon Guillet. An exhaustive study of alloys of copper, zinc, and a third metal, the researches including brasses containing aluminum, manganese, iron, tin, lead, silicon, magnesium, antimony, or phosphorus. 20000 w. *Revue de Métallurgie*—May, 1906. No. 77667 H.

# MECHANICAL ENGINEERING

## Brittleness

## MATERIALS OF CONSTRUCTION

## Chromium

Effect of Arsenic on Brass. E. S. Sherry, in *The Brass World*. Showing that arsenic causes greater fluidity, and is not injurious unless more than 0.02 per cent. is present. 1000 w. Mech Engr—June 2, 1906. No. 77261 A.

### Brittleness.

The Effect of Nitrogen on Iron and Steel. Abstract of a monograph by Dr. Hjalmar Braune, discussing the effect of minute quantities of nitrogen in producing brittleness in iron and steel. 800 w. R R Gaz—Vol. XL. No. 6. No. 74949.

Brittleness in Steel and Fractures in Boiler Plates. C. E. Stromeyer. Abstract. A report of tests, with accounts of cases of fracture and the investigations made. 4000 w. Mech Engr—Oct. 13, 1906. No. 80040 A.

### Bronze.

Manganese-Bronze and Its Manufacture. Edwin S. Sperry. Abstract from an article in the *Brass World*. Gives the history of this alloy, explaining the theory and describing the manufacture. 3000 w. Am Mach—Vol. 29. No. 5. No. 74816.

### Cast Iron.

Malleable Cast-Iron. Charles H. Day. Reviews the development, especially in the United States, since 1826, and describes the present process of manufacture. 3800 w. Am Mach—Vol. 29, No. 14. No. 75945.

The Constitution of Cast Iron (Ueber die Konstitution des Roheisens) P. Goerens. A metallographical study of the physical structure of cast iron, with reproductions of microphotographs. 4000 w. Stahl u Eisen—April 1, 1906. No. 76230 D.

Influence of Silicon Phosphorus, Manganese, and Aluminium on Chill in Cast Iron. E. Adamson. Describes experiments made to determine the influence of these metalloids on chill, and to obtain comparative data on mechanical tests and other conditions. 5400 w. Ills. Ir & St Inst—May, 1906. No. 76919 N.

The Influence of the Condition of the Carbon upon the Strength of Cast Iron as Cast and Heat Treated. W. H. Hatfield. Abstract report of research work. 2000 w. Ir & Coal Trds Rev—May 11, 1906. No. 76922 A.

Volume and Temperature Changes During the Cooling of Cast Iron. Thomas Turner. Remarks on attempts to measure shrinkage of cast iron, with description of apparatus adopted by the author, and method of determining temperature. Gives also particulars of the contraction and temperature changes of a few ex-

amples. 4000 w. Ir & St Inst—May, 1906. No. 76911 N.

Malleable Cast Iron. G. A. Akerlind. Abstract of a paper read at meeting of the Scandinavian Tech. Soc. Reviews the manufacture of malleable cast iron in its different stages and considers it as a material of construction. 2500 w. Mech Engr—June 30, 1906. No. 77877 A.

Malleable Cast Iron. G. A. Akerlind. Abstract of a paper read before the Scandinavian Tech. Soc. Reviews the manufacture of malleable cast iron in its different stages, and discusses it as a material of construction. 2400 w. Ir Trd Rev—Aug. 23, 1906. No. 78800.

Malleable Cast Iron. G. A. Akerlind. Abstract of a paper read before the Scandinavian Tech. Soc. Reviews the manufacture of malleable cast iron and points in regard to its use as a material of construction. 2400 w. Mech Engr—Sept. 8, 1906. No. 79228 A.

The Beneficial Effects of Adding High Grade Ferro-Silicon to Cast Iron. Alexander E. Outerbridge, Jr. Read before the Am. Found. Assn. A report of experiments and results obtained by controlling the proportion of silicon, showing a reliable means of producing soft, but strong castings, from metal of medium grade. 3000 w. Ir & Coal Trds Rev—June 29, 1906. No. 77899 A.

Some Notes on the Chemistry of Cast Iron. L. Houghton. Read before the British Found. Assn. Considers carbon, silicon, manganese and sulphur, and phosphorus. Ills. 3000 w. Ir Trd Rev—Oct. 18, 1906. No. 79822.

### Chain Testing.

Denison's Apparatus for Detecting the Overloading of Chains. Illustrates and describes this appliance. 500 w. Mech Engr—Oct. 6, 1906. No. 79791 A.

### Chemistry.

The Chemist in the Machine Shop. H. S. Brown. Shows the importance of having analyses of stock made in the construction of all machinery, and that it will add to the life of the finished machine and will reduce the cost. Ills. 2500 w. Ir Age—May 31, 1906. No. 77031.

### Chromium.

The Use of Ammonium Persulfate in the Determination of Chromium in Steel. Harry E. Walters. Gives an outline of method used by the writer, applicable for ordinary chrome steel, but not for tungsten or molybdenum steels. 1000 w. Pro Engrs' Soc of W Penn—Dec., 1905. No. 74065 D.

# MECHANICAL ENGINEERING

## Corrosion

### Corrosion.

The Relative Corrosion of Wrought Iron and Steel. Henry M. Howe. A contribution to the discussion on the "Corrosion of Iron and Steel" at the meeting of the Am. Soc. for Test. Materials, June 22, 1906. 1400 w. *Ir Age*—June 28, 1906. No. 77499.

Electro-Positive Coatings for the Protection of Iron and Steel from Corrosion. Sherard Cowper-Coles. Read before the British Assn. Describes a new method for obtaining metallic coatings, by coating iron with zinc. Ills. 3500 w. *Elec Engr*, Lond—Aug. 31, 1906. No. 79124 A.

### Crucible Steel.

An Etching Method for Determining Whether Steel Has Been Made by the Crucible Process. James A. Aupperle. Describes the method used by the writer. 400 w. *Ir & St Mag*—May, 1906. No. 76799 D.

### Crushing.

Crushing Tests of the Diamonds Used in Drilling. Prof. Alexander N. Mitinsky. Reports tests made, the results leading to the conclusion that the pressure on drilling-tools can safely be made heavier, and give an increased gain in speed of drilling. 700 w. *Am Inst of Min Engrs*—Jan., 1906. No. 74710.

### Deformation.

Experimental Technology of Deformation of Materials, and Its Application to Metal-Working Processes. H. I. Hannover. Gives a general view of what is known about the processes of deformation in tough bodies, especially tough metals, by compression, tension, impact, etc. 4000 w. *Am Mach*—Vol. 29. No. 32. Serial. 1st part. No. 78520.

### Explosives.

The Manufacture of High Explosives. W. H. Booth. An illustrated article describing the processes of manufacture and the precautions necessary. 7000 w. *Cassier's Mag*—Aug., 1906. No. 78568 B.

### Fatigue.

Season-Cracking of Brass and Bronze Tubing. Edwin S. Sperry. From *The Brass World*. Considers the fatigue of the metal to be the cause of the season-cracks, and that hydraulic drawing-benches cause this condition. 2500 w. *Mech Engr*—March 10, 1906. No. 75584 A.

### Fractures.

Fracture of Axles Originating in Drilled Holes. Lucien Alphonse Legros. Calls attention to the risk incurred by drilling holes in axles and shafts, and the importance of examining shafts or axles

## MATERIALS OF CONSTRUCTION

## Lubricants

so drilled with a view to detecting signs of fracture. Ills. 500 w. *Inst of Civ Engrs*—No. 3582. No. 79520 N.

### Hardening.

The Molecular Changes in Hardening (Die Molekularen Vorgänge beim Härten). Otto A. Böhrer. An address explaining the phenomenon of the hardening of steel according to the solution theory, with illustrations of cooling curves. 2000 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—June 30, 1906. No. 78151 D.

### Heat Insulation.

Notes on Heat Insulation, Particularly with Regard to Materials Used in Furnace Construction. R. S. Hutton and J. R. Beard. Read before the Faraday Society. A report of experiments for the measurement of thermal conductivities of granular materials up to 100 degrees C. giving their relative value, and describing apparatus used. Ills. 1700 w. *Sci Am Sup*—May 5, 1906. No. 76503.

### Heat Treatment.

The Heat Treatment of Steel in Large Masses (Wärmebehandlung von Stahl in Grossen Massen). O. Bauer. A comparison of the conditions existing in laboratory tests with those obtaining in actual practice, especially as regards mass and time. 2500 w. *Stahl u Eisen*—Nov. 1, 1905. No. 73369 D.

### High Temperatures.

Strength of Mild and Cast Steel at High Temperatures. Reviews the results obtained in a series of tests made by Prof. C. Bach, of Stuttgart. 2000 w. *Engng*—March 30, 1906. No. 76013 A.

### Impact Tests.

Repeated-Impact-Testing Machine at the National Physical Laboratory. Illustrated description of a self-acting machine and its operation. 700 w. *Engng*—July 13, 1906. No. 78214 A.

### Internal Strains.

Internal Stresses and Strains in Iron and Steel. Henry D. Hibbard. Discusses those internal strains caused by an irregular rate of change in temperature, and by cold-working. Read before the joint meeting of the A. I. M. E. and the Ir. & St. Inst. 8000 w. *Ir & Coal Trds Rev*—July 27, 1906. No. 78483 A.

### Lubricants.

Friction, Lubricants and Lubrication. Stanley H. Moore. Discusses these subjects in detail. 3000 w. *Power*—Dec., 1905. No. 73708 C.

Oils and Oiling. H. R. Carter. The various kinds of oil are discussed and their value as lubricants, illustrating instruments used in testing them. 2400 w.

# MECHANICAL ENGINEERING

## Manganese

Prac Engr—Dec. 15, 1905. Serial. 1st part. No. 74040 A.

Government Tests of Lubricating Oils. A. B. Willits. An account of the specifications for lubricating oil for marine machinery and the required tests, especially the gumming test, illustrating the apparatus used. 1000 w. Ir Age—Jan. 25, 1906. No. 74539.

The Engineering Value of Lubricating Oils. William F. Parish, Jr. Abstract of a paper read before the N. E. Coast Inst. of Engrs. & Shipbldrs. Reports a comparative power test made by experts, and gives other information in regard to lubrication. 2500 w. Ir & Coal Trds Rev—March 16, 1906. No. 75810 A.

Notes on Lubrication. William F. Parish, Jr. Abstract of a paper read before the Rugby Engng. Soc. Discusses the chemical composition, manufacture and testing of oils for lubrication, the practical application and results. General discussion. 5500 w. Elec Engr, Lond—Sept. 7, 1906. No. 79217 A.

## Manganese.

Some Uses of Pure Manganese and Its Alloys. Remarks showing the large field of usefulness for this metal and its value to the metal founder. 1200 w. Ir & Coal Trds Rev—June 29, 1906. No. 77900 A.

## Manganese-Bronze.

Manganese Bronze and Its Manufacture. Abstract from an article by Edwin S. Sperry in *The Brass World*. Gives the history, theory, analysis, etc. 3000 w. Sci Am Sup—March 31, 1906. No. 75829.

## Metallography.

Practical Notes on Metallography (Einiges aus der Metallographischen Praxis). E. Heyn. A discussion of the applications of microscopical examinations in connection with the testing of materials, as conducted in the Royal testing laboratory at Grosslichterfelde-West, near Berlin. 4000 w. 2 plates. Stahl u Eisen—Jan. 1, 1906. No. 74645 D.

Notes on Technical Details of Metallography (Einiges aus der Metallographischen Technik). P. F. Dujardin. Discussing details relating to the polishing of the metal surfaces and the arrangement of the microscope and camera for lighting and photographing the enlarged image. Serial. Part I. 3000 w. Stahl u Eisen—May 1, 1906. No. 76810 D.

Practical Application of Metallography in the Iron Industry (Ueber die Nutzanwendung der Metallographie in der Eisenindustrie). E. Heyn. A general re-

## MATERIALS OF CONSTRUCTION

## Pig Iron

view of the progress which has been made in the study of the physical constitution of the iron alloys, showing how the microscopic study of metals may be practically applied. 7500 w. Serial. Part I. Stahl u Eisen—May 15, 1906. No. 76812 D.

## Metals.

The Internal Architecture of Metals. Editorial review of a lecture by Prof. J. O. Arnold, before the Royal Institution. 1500 w. Engng—March 2, 1906. No. 75509 A.

Address to the Engineering Sections of the British Association for the Advancement of Science. J. A. Ewing. Considers the inner structure of metals and the manner in which they yield under the strain. 6000 w. Elec Engr, Lond—Aug. 3, 1906. No. 78546 A.

The Structure of Metals. Prof. J. A. Ewing. Read before the British Assn. for the Adv. of Science. Reviews recently acquired knowledge, by aid of the microscope, which gives engineers and physicists a better understanding of metals. 2000 w. Sci Am Sup—Sept. 29, 1906. No. 79502.

## Nickel Steel.

Nickel Steel and Its Application to Boiler Construction. G. B. Waterhouse. A brief survey of the properties of nickel steel that make them especially adapted for this use. 2000 w. Ir Age—Feb. 8, 1906. No. 74903.

## Overstrain.

Effect of Low Temperature on the Recovery of Steel from Overstrain. E. J. McCaustland. A report of tests made giving an outline of the scheme of experiments, with explanation of methods, conditions, and conclusions. 4500 w. Bul Am Inst of Min Engrs—May, 1906. No. 77176 C.

Fatigue of Materials. Discusses the accident at Dowlais Cardiff Colliery in South Wales, April 28, and the cause of the breakage of the link in the chain holding the trams. 2000 w. Min Rept—Sept. 13, 1906. No. 79203.

## Packings.

Hydraulic Packings. A. Reeder. Illustrates examples of packings and types of connections, giving explanations. 1700 w. Am Mach—Vol. 29. No. 36. No. 78974.

## Pig Iron.

Grading Pig Iron. Reginald Meeks. Showing how much more reliable are irons mixed from grades by chemical analysis, than by the old method of grad-

# MECHANICAL ENGINEERING

## Rivets

ing by fracture. 1500 w. Eng & Min Jour—April 28, 1906. No. 76400.

Specifications for Foundry Pig-Irons. W. B. Parker. Discusses the possibility of evolving a system without unduly disturbing present systems of supply. The composition and grading are considered. 7500 w. Ir & Coal Trds Rev—June 29, 1906. No. 77898 A.

## Rivets.

The Resistance of Rivets Placed Hot (Résistance des Rivets après Mis en Place à Chaud) E. Simonot. A record of experimental tests showing the increase in the strength of rivets over that of the original bar when the rivets are used hot. 1200 w. Génie Civil—April 7, 1906. No. 76221 D.

## Scrap.

Ingotting Scrap Metals. Walter J. May. Suggestions for the utilization of scrap metal. 800 w. Prac Engr—July 27, 1906. No. 78460 A.

## Shear.

Behavior of Materials of Construction Under Pure Shear. E. G. Izod. A report of experimental tests made of the better known and commercially used materials. 3300 w. Ills. Inst of Mech Engrs—Dec. 15, 1905. No. 74064 D.

## Shearing.

Shearing Strength of Structural Steels. Ch. Frémont, in *Revue de Métallurgie*. Reports experiments which lead to the conclusion that the shear diagram of an ordinary structural steel between two parallel cutting edges furnishes material for determining the elastic limit, the breaking strength, and ductility, with as much accuracy as the tensile test. 1800 w. Ir & Coal Trds Rev—June 8, 1906. No. 77392 A.

The Resistance of Structural Steel to Shearing (Résistance au Cisaillage des Aciers de Construction). Ch. Frémont. Discussing shearing as an action of tension and not of sliding, with diagram showing the relation of the shearing resistance to the elastic limit in tension. 4000 w. *Revue de Métallurgie*—May,

## Steel.

The Range in Tensile Properties of a Low Carbon Steel. James E. Howard. Reports tests made at the Watertown Arsenal showing a wide range in tensile strength due to methods of treatment. 800 w. Ir Age—April 26, 1906. No. 76313.

Quaternary Steels. Leon Guillet. Abstract of research work on 12 varieties of these steels with conclusions. 6000 w. Ir & Coal Trds Rev—May 11, 1906. No. 76920 A.

## MATERIALS OF CONSTRUCTION

## Steel Hardening

Special Auto Steels and Their Properties. Rene M. Petard. Discusses special mixtures of steel, with reference to other materials. 2300 w. Automobile—May 10, 1906. Serial. 1st part. No. 76596.

Investigations on Steels Containing Copper (Recherches sur les Aciers au Cuivre). Pierre Breuil. Preliminary data upon copper-steel alloys showing the hardening action of the copper, and the singular points in the cooling curve. 1500 w. Comptes Rendus—June 18, 1906. No. 78126 D.

Nickel and Carbon Steels. Edward Dixon. Discusses results of recent investigations and their importance in the developments of petrol engines. 1000 w. Engng—July 6, 1906. No. 77985 A.

The Strength and Ductility of Steel. F. E. Cardullo. A discussion of the elements present in the steel, and how strong and how tough the various substances make it; also the effect of treatment during the process of manufacture. 2500 w. Mach, N Y—July, 1906. No. 77701 C.

Copper Alloy Steels (Sur les Aciers au Cuivre). Pierre Breuil. Data and results of drop tests on nicked bars, also torsion and hardness tests, and resistance to corrosion. 1500 w. Comptes Rendus—Aug. 27, 1906. No. 79330 D.

Heat-Treatment of Steels Containing Fifty and Eighty Hundreths Per Cent of Carbon. C. E. Corson. Describes experimental investigations, giving micrographs. 3000 w. Bul Am Inst of Min Engrs—Sept., 1906. No. 79849 D.

The Nickel-Chrome Steels (Aciers Nickel-Chrome). L. Guillet. A general study of the micrographic properties of the nickel chromium group of steels, with data showing their mechanical applications. 4500 w. *Revue de Métallurgie*—Aug., 1906. No. 79927 H.

The Nickel Silicon Steels (Aciers Nickel-Silicium). L. Guillet. A study of the nickel-silicon alloy steels and their practical applications. 5000 w. *Revue de Métallurgie*—Oct., 1906. No. 79931 H.

See also Mining and Metallurgy, Iron and Steel.

## Steel-Hardening.

Steel Hardening Metals. Joseph Hyde Pratt. Information from advance sheets of a report to the U. S. Geol. Survey for 1905. Concerning nickel, chromium, manganese, tungsten, molybdenum, vanadium, titanium, cobalt and uranium. 5000 w. Ind Wld—Aug. 18, 1906. No. 78616.

# MECHANICAL ENGINEERING

## Stresses

## MATERIALS OF CONSTRUCTION

## Tool Steels

### Stresses.

Simplified Methods for Rendering Neutral Layers Visible (Vereinfachtes Verfahren zur Sichtbarmachung der Neutralen Schichte). Otto Höningsberg. An account of experiments upon glass beams with polarized light, supplementing those of the author published in March, 1904. 1200 w. Zeitschr d Oesterr Ing u Arch Verein—Oct. 20, 1905. No. 73327 D.

### Tantalum.

Tantalum: Its Ores, Detection, Properties, and Uses. Frank H. Michell, and W. A. Michell. Information concerning this rare metal which, up to the present, is used chiefly for electric lamps. 2500 w. Min Jour—Sept. 29, 1906. No. 79700 A.

### Testing.

The American Society for Testing Materials. Paul Kreutzpointner. An address on the work, value, and national economic aims and importance of this society. 4500 w. Pro Engrs' Soc of W Penn—Oct., 1905. No. 72981 D.

Drop Tests on Nicked Bars (Schlagbiegeproben an Eingekerbten Stäben). C. J. Snyders & P. A. M. Hackstroh. A translation from *De Ingenieur* of drop testing work on nickel steel bars, conducted by the engineer staff of the Netherlands army. 5000 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 22, 1905. No. 74619 D.

Testing Machine for Anchors and Chain Cables (Anker und Kettenprüfmaschine). Illustrating a 150-ton testing machine, designed to admit the anchors of ships, as well as heavy chain cables. 2000 w. Zeitschr d Ver Deutscher Ing—Dec. 23, 1905. No. 74601 D.

The Guillery Hardness-Testing Apparatus. Illustrates and describes three pieces of apparatus designed by M. Guillery, for testing hardness, elastic limit, and brittleness. 1800 w. Engng—Jan. 12, 1906. No. 74524 A.

Impact Testing. Capt. Riall Sankey. Remarks concerning the various shock or impact tests at present in use, describing more particularly the one-blow method. 4800 w. Engr, Lond—Jan. 26, 1906. No. 74889 A.

600,000-Lb. Vertical Testing-Machine. Illustrated description of a machine of great capacity, built by a Philadelphia firm. 600 w. Engng—Feb. 16, 1906. No. 75284 A.

Purdue University Impact Testing Machine. W. K. Hatt and W. P. Turner. Read before the Am. Soc. for Test. Mat. Mentions three impact testing machines in the equipment of the

laboratory, and illustrates and describes an improved machine for scientific and standard tests in compression and flexure. 2000 w. Ry & Engng Rev—June 30, 1906. No. 77735.

Large Testing-Machines in South Wales, 1829—1906. J. Hartley Wicksteed. Describes the first testing-machine ever constructed, giving drawings and gives an illustrated description of a 350-ton horizontal machine showing the most recent development. 2000 w. Inst of Mech Engrs—July 30, 1906. No. 78560 D.

Methods of Testing Metals by Alternate Strains and Thermic Treatment of Steels to Increase Their Resistance. James E. Howard. Abstract of a discussion before the Brussels Congress of the International Assn. for Testing Materials. 2000 w. Eng Rec—Sept. 22, 1906. No. 79433.

The Measuring Box as a Pressure Indicator (Die Messdose als Kraftmesser). A. Martens. Describing the use of a closed vessel with flexible diaphragm for use in indicating the pressures employed in testing machines. 1800 w. Zeitschr d Ver Deutscher Ing—Aug. 18, 1906. No. 79306 D.

A 600,000-Pound Screw-Testing Machine. Illustrated detailed description of a fine machine recently completed for the University of Illinois. 1000 w. Am Mach—Vol. 28, No. 51. No. 73975.

Allowable Unit Loads on Knife Edges for Testing Machines and Heavy Weighing Scales. Jos W. Bramwell. Gives the writer's opinions which are based on extensive study of the weighing mechanism of testing machinery having knife edge supports for its levers. 700 w. Eng News—June 14, 1906. No. 77436.

### Test-Pieces.

The Relation Between Type of Fracture and Micro-Structure of Steel Test-Pieces. C. O. Bannister. Report of researches, giving photographs of fractures of a number of types, with descriptions and examinations, with a summary of conclusions. 3500 w. Ir & St Inst—May, 1906. No. 76917 N.

### Tool Steels.

High-Speed Steel in the Factory. O. M. Becker. The fourth article deals with the design and operation of tools and machines for use with high-speed steel. 6000 w. Engineering Magazine—Dec., 1905. No. 73378 B.

High-Speed Steel in the Factory. O. M. Becker. Mr. Becker's fifth paper deals especially with the range and adaptability of alloy-steel tools, showing them to be as well adapted for finishing cuts

# MECHANICAL ENGINEERING

## Tool Steels

as for roughing. 4500 w. Engineering Magazine—May, 1906. No. 76276 B.

High-Speed Steel in the Factory. O. M. Becker. Mr. Becker's sixth paper discusses the action of the tool at work, showing the conditions of maximum effect, and considering the proper care in the use of the tools. 3000 w. Engineering Magazine—June, 1906. No. 76877 B.

High-Speed Steel in the Factory. O. M. Becker. The seventh paper of the series discusses speeds and feeds with alloy steels showing the practical results which may be expected in the shop. 4000 w. Engineering Magazine—August, 1906. No. 78196 B.

The Practical Use and Economy of High-Speed Steel. J. M. Gledhill. Abstract of a paper read before the Glasgow & W. of Scotland Foremen Engrs. & Ironworkers Assn. Gives some comparative experiments with a view to ascertaining the saving in power absorbed with high-speed cutting. Illustrates some machines, and work accomplished. 2700 w. Ir & Coal Trds Rev—Nov. 17, 1905. No. 73461 A.

Tests of High-Speed Tool Steels on Cast Iron. L. P. Breckenridge and Henry B. Dirks. Description, with illustrations, of experiments made in the shops at the University of Illinois. 3300 w. Am Mach—Vol. 29, No. 10. No. 75427.

A Defective Bar of Tool Steel. C. E. Carson. A study of the cause for the failure of a finished tool from a bar of steel, showing that the steel did not receive sufficient work in drawing the ingot to render the finished bar sound. Ills. 600 w. Ir and St Mag—April, 1906. No. 76039 D.

High-Speed Tool Steel Tests. A report of the interesting tests of high-speed steel tools carried out on cast iron, at the University of Illinois Engineering Experimental Station, U. S. A. 2500 w. Engng—July 20, 1906. No. 78305 A.

The Internal Structure of Hardened and Tempered Tool Steel (Ueber den Innern Aufbau Gehärteten und Angelasenen Werkzeugstahls). E. Heyn & O. Bauer. A study of the relation of the constituents Troostite and Sorbite in hardened carbon tool steels. Serial. Part I. 3500 w. Stahl u Eisen—July 1, 1906. No. 78146 D.

Tempering and Cutting Tests of High-Speed Steels. H. C. H. Carpenter. A report of researches undertaken to ascertain whether the temperature at which high-speed steels soften can be pushed

## MATERIALS OF CONSTRUCTION

## Wood Pulp

higher than 700° C. Ills. 5500 w. Ir & St Inst—July, 1906. No. 78346 N.

### Tubes.

Collapsing Pressures of Bessemer Steel Lap-Welded Tubes Three to Ten Inches in Diameter. Reid T. Stewart. Reports a research undertaken to supply reliable information on the behavior of modern wrought tubes when subjected to fluid collapsing pressure. Ills. 16200 w. Am Soc of Mech Engrs, No. 091—May, 1906. No. 76101 E.

### Vaults.

Armor Plate—The Last Answer of the Banker to the Burglar. Traces the development of the use of special material in vault construction, describing the latest vaults, consisting of face-hardened, Harveyized plates from 5 to 16 inches in thickness, so accurately dove-tailed and locked together as to render the construction seemingly proof against any attack. 2700 w. Sci Am—April 21, 1906. No. 76135.

### Wastes.

Utilization of Waste Materials. From the German of Dr. Theodore Koller. Deals with the utilization of amber scrap, paraffine waste, furrier's waste, etc. 2500 w. Sci Am Sup—June 30, 1906. No. 77712.

### Waterproofing.

Practical Methods of Waterproofing and Fireproofing. Dr. Koller. Gives methods for making textile fabrics and pasteboard incombustible. 1000 w. Sci Am Sup—April 21, 1906. No. 76137.

### White Alloys.

The Strength and Elasticity of White Metal. John Goodman. Reports tests made with the object of ascertaining the physical properties of some white alloys which are used in the construction of pumps required for dealing with acids, alkalies, etc. 1000 w. Engng—Sept 21, 1906. No. 79582 A.

### Wire.

The Heat Treatment of Wire, Particularly Wire for Ropes. J. Dixon Brunton. Abstract of research work made with a view to ascertaining the correct heat treatment. 3800 w. Ir & Coal Trds Rev—May 11, 1906. No. 76921 A.

### Wood Pulp.

Brimstone versus Pyrite for Wood-Pulp Manufacture. Ernst A. Sjöstedt. A comparison of the value of brimstone and pyrite for sulphite pulp making. 1500 w. Eng & Min Jour—April 28, 1906. No. 76399.

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## MEASUREMENT

### Accelerometers

#### Accelerometers.

Acceleration and Accelerometers. A. P. Trotter. Read at the Junior Inst. of Engrs. Explains the principle of the accelerometer and its behavior. 3000 w. Engng—March 9, 1906. No. 75602A.

#### Air Flow.

On the Measurement of Air Flowing Into the Atmosphere Through Circular Orifices in Thin Plates and Under Small Differences of Pressure. R. J. Durley. Describes experiments made at McGill University. Ills. 5000 w. Trans Am Soc of Mech Engrs (No. 081)—Dec., 1905. No. 73441 D.

#### Angles.

A Straight-Line Instrument for Trisecting an Angle. F. I. Llewellyn. Illustrated description of the instrument and its application. 600 w. Eng News—Jan. 4, 1906. No. 74174.

#### Automobile Testing.

A Modern Testing Plant for Gasoline Automobile Motors. Dr. Alfred Gradenwitz. Brief illustrated description of a testing plant in Berlin. 700 w. Sci. Am. Sup—March 3, 1906. No. 75323.

Measuring Power at the Road Wheels. Illustrates and describes the testing plant at Purdue University at Lafayette, Indiana, its construction and action. 2200 w. Auto Jour—March 3, 1906. No. 75493A.

#### Beams.

Sections of Cast Iron Beams. C. H. Benjamin. Presents results of interesting experiments made by students of the Case. School to determine the relative strength and stiffness of cast-iron beams having cross-sections of the same area but of different shapes. 2000 w. Mach, N Y—May, 1906. No. 76460 C.

#### Bending.

A Simple Method for the Calculation of the Bending Strength of Curved Pieces. S. E. Slocum. Gives a method for calculating the strength of curved pieces having any form of cross section whatever. 1200 w. Eng News—May 31, 1906. No. 77040.

#### Blows.

Effect of a Blow. Alexander W. Moseley and John Lord Bacon. A report of tests made to measure what a blow does to the piece struck. 900 w. Am Soc of Mech Engrs, No. 096—May, 1906. No. 76104.

#### Calorimeter.

Alcohol Calorimeter for Coal Testing. W. M. Wallace. Describes methods of using calorimeters, especially the good

### Calorimeter

results obtained with the alcohol calorimeter. 1200 w. Engng—April 20, 1906. No. 76456 A.

How to Make and Use a Coal Calorimeter. J. F. Boughton. Illustrated description of the apparatus made and its manipulation. 1500 w. Power—Sept., 1906. No. 78877 C.

Notes on the Calibration of a Fuel Calorimeter. C. J. Evans. Explains the calibration of an instrument on the Thomson principle. 900 w. Engng—Aug. 31, 1906. No. 79141 A.

#### Centre of Gravity.

The Centre of Gravity of Spiraloïd Systems (Centres de Gravité de Systèmes Spiraloïdes). Haton de la Goupillière. A study of the centre of gravity of masses arranged in a logarithmic spiral. 2000 w. Comptes Rendus—May 28, 1906. No. 77645 D.

The Determination of the Centre of Gravity of Discontinuous Systems (Centres de Gravité de Systèmes Discontinus). Haton de la Goupillière. A mathematical discussion, deriving general formulas for a number of bodies disposed in a circle. 2500 w. Comptes Rendus—May 14, 1906. No. 77642 D.

The Geometric Position of the Centre of Gravity (Lieux Géométriques de Centres de Gravité). Haton de la Goupillière. A mathematical examination of the position of the centre of gravity of a circular wire of increasing length. 2000 w. Comptes Rendus—May 21, 1906. No. 77643 D.

#### Centrifugal Stresses.

Experiments on the Strength of Rotating Disks (Versuche über die Festigkeit Rotierender Scheiben). M. Grubler. An account of the continuation of the author's experiments to determine the bursting speeds of emery wheels and similar disks 3000 w. Zeitschr d Ver Deutscher Ing—Feb. 24, 1906. No. 75706 D.

The Stresses in Rotating Discs of Varying Thickness (Der Spannungszustand in Rotierenden Schreiben Veränderlicher Breite) M. Grubler. A mathematical investigation of the stresses produced in discs operated at high rotative speeds, with especial reference to the wheel of the de Laval steam turbine. 1800 w. Zeitschr d Ver Deutscher Ing—April 7, 1906. No. 76207 D.

#### Colorimeter.

A New Colorimeter for the Determination of Carbon in Steel. Charles H. White. Illustrated description of an instrument designed for the rapid and



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## Crank Motion

accurate application of the method based on the thickness or depth of the portion of the solution examined. 2000 w. *Bul Am Inst of Min Engrs*—Sept., 1906. No. 79850.

## Crank Motion.

Dynamic Force Plan for Crank Motions (*Dynamischer Kraft plan des Kurbelgetriebes*). Ferdinand Wittenbauer. A brief description of a method of projecting the action of the forces of a crank and connecting-rod motion in a graphical diagram. 1000 w. *Zeitscher d Ver Deutscher Ing*—June 16, 1906. No. 78101 D.

## Crushing.

The Influence of Velocity upon the Law of the Deformation of Metals (*Influence des Vitesses sur la Loi de Déformation des Metaux*). P. Vieille & R. Lionville. Discussing the use of metal crushers for determining the pressures in guns, and showing the uncertainty of results made at such high velocities. 1000 w. *Comptes Rendus*—May 14, 1906. No. 77641 D.

## Curves.

The Holbrook Spiral Curve. Prof. W. D. Taylor. Reprinted account of the properties of this curve and of its use. 1000 w. *Wis Engr*—Feb., 1906. No. 75311 D.

## Cut-Meter.

The Warner Auto-Meter and Cut-Meter. Hugh Dolnar. Illustrates and describes the construction, operation, and calibration. 2500 w. *Am Mach*—Vol. 29. No. 25. No. 77409.

## Dynamometer.

A New Swiss Dynamometer. Emile Guarini. Illustration, with description of a new type of geared dynamometer, having a capacity of 12 horse-power. 800 w. *Am Mach*—Vol. 28, No. 46. No. 73214.

A Dynamometric Brake for the Measurement of the Power of Motors (*Sur un Frein Dynamometrique Destiné à la Mesure de la Puissance de Moteurs*). A. Krebs. Describing a form of electric brake permitting the utilization of the greater portion of the power developed. 1500 w. *Comptes Rendus*—Nov. 13, 1905. No. 73827 D.

Bailey's Dynamometer. Brief Illustrated description of a design that will indicate automatically the number of revolutions, and the weight or degree of resistance. 400 w. *Mech Engr*—March 17, 1906. No. 75697 A.

A New Absorption Dynamometer. Illustrates and describes a portable measuring brake that can be applied instantly

## MEASUREMENT

## Indicator

to any size engine or motor, by means of which the power absorbed can be accurately measured. The Sellers' dynamometer. 700 w. *Prac Engr*—Sept. 14, 1906. No. 79439 A.

## Elastic Limit.

Determination of the Elastic Limit of Metals (*Mesure de la Limite Elastique des Metaux*). R. Guillery. The elastic limit is determined by recording graphically the variations in the electrical resistance of the test piece while under tension. 3500 w. *Revue de Metallurgie*—June, 1906. No. 77670 H.

## Flexure.

A Complete Analysis of General Flexure in a Straight Bar of Uniform Cross-Section. L. J. Johnson. States the problem and gives the solution. 7000 w. 1 plate. *Prs Am Soc of Civ Engrs*—Feb., 1906. No. 75341 E.

## Flow.

Measuring Apparatus for Gases Flowing Through Pipes. Illustrated description of the Beardmore measuring and recording apparatus and its operation. 900 w. *Mech Engr*—June 30, 1906. No. 77878 A.

Flow of Air and Other Gases, with Special Reference to Small Pressure Differences. Sanford A. Moss. Gives a collection of simplified and general formulas for velocity and discharge, with instructions for use. 4000 w. *Am Mach*—Vol. 29. No. 38. Serial. 1st part. No. 79294.

## Gases.

Constants for Gases. Reviews the calculations of J. D. Van der Waals, Sr., and J. D. Van der Waals, Jr., and of Daniel Berthelot and others. 1400 w. *Engng*—July 20, 1906. No. 78307 A.

## Hardness.

Apparatus for Determining Hardness by the Brinell Ball Test. The essential principle of this test consists in forcing a hardened steel ball partly into the test sample so as to effect a slight impression, the dimensions of which serve as a basis for determining the hardness. Ills. 1200 w. *Am Mach*—Vol. 29. No. 29. No. 78052.

## Impact.

Collision, Direct and Oblique, With and Without Friction. Robert H. Smith. The present number is a study of "normal central impact" which produces no tangential force and no spinning in the masses. 2500 w. *Engr, Lond*—Feb. 23, 1906. Serial, 1st part. No. 75377 A.

## Indicator.

The Frahm Speed Indicator. W. C.

# MECHANICAL ENGINEERING

## Inertia

Martin. Plate and description, with explanation of the action. 1000 w. Trans Inst of Engrs & Shipbuilders in Scotland—Feb., 1906. No. 75210 D.

An Improved Stress-Strain Indicator. Describes the action of an ingenious instrument, recently patented by A. Sug-gate, which is capable of measuring stresses of any kind in any material that is undergoing a strain. 2000 w. Prac Engr—March 2, 1906. No. 75495 A.

The Calibration of Indicator Springs (Bestimmung über die Feststellung der Mass stäbe für Indikatorfedern). C. Bach. A report of the joint committee of the *Reichsanstalt* and the *Verein Deutscher Ingenieure* upon standard methods of standardizing the springs of steam-engine indicators; with practical examples and a brief bibliography. 3000 w. Zeitschr d Ver Deutscher Ing—May 5, 1906. No. 76808 D.

## Inertia.

The Determination of the Moment of Inertia of Revolving Bodies (Bestimmung der Trägheitsmomente von Umdrehungskörpern). Sigmund Wel-lisch. A graphical and analytical study, with practical applications to bodies of various forms. 3000 w. Zeitschr d Oesterr Ing u Arch Ver—Nov. 24, 1905. No. 73823 D.

## Liquids.

A New Liquid Measuring Apparatus. George B. Willcox. An automatic device for measuring the brine flowing from a salt well into a salt works. The volume of the brine is determined by its weight. 1500 w. Am Soc Mech Engrs—No. 093. May, 1903. No. 76102.

## Measuring Machine.

Recent Improvements in the Newall Measuring Machine. Illustrates and de-scribes the new features recently intro-duced and the increase in size, the latest machine having a capacity of six feet. 900 w. Am Mach—Vol. 28, No. 48. No. 73539.

An Electrical Measuring-Machine for Engineering Gauges and Other Bodies. P. E. Shaw. Abstracted from the Phil. Trans. of the Roy. Soc. Describes a method having the advantage of being more sensitive than the old method, and giving an illustrated description of the machine used. 5000 w. Engng—June 29, 1906. No. 77896 A.

## Metallography.

Practical Applications of Microscopic Metallography in the Workshop (Des Applications Pratiques de la Métallo-graphie Microscopique dans les Usines).

## MEASUREMENT

## Pitometer

H. Le Chatelier. Showing the extent to which the microscope may be used in practical metallurgical operations. 6000 w. Revue de Métallurgie—Sept., 1906. No. 79928 H.

## Metric System.

Tennessee Congressman Denounces Metric System. John Wesley Gaines. Objects to the French methods being made compulsory, showing the ample freedom existing under the present law. 2800 w. Am Mfr—May 10, 1906. No. 76595.

The Metric System. A review of the recent movement in regard to the adop-tion of this system in the United States. 3300 w. Am Mach—Vol. 29. No. 15. No. 76035.

The Proposal to Force the Use of the Metric System. H. H. Suplee. A call for continued united action against the enactment of any legislation compelling the enforced use of the metric system of weights and measures, either in the Gov-ernment service or in private industries, urging that the present freedom of ac-tion be continued. 2500 w. Engineering Magazine—May, 1906. No. 76272 B.

## Micrometer.

A New Type of Micrometer. Walter C. Durfee. Describes what is called a rolling lens micrometer and its chief merit is said to be its ease of manipula-tion. 1000 w. Harvard Jour of Engng—June, 1906. No. 77333 D.

An Electric Micrometer for Measuring the Seventy-Millionth Part of an Inch. Illustrated description of a machine de-signed by Dr. P. E. Shaw, of England, which is of great importance to scientific investigators. 2500 w. Sci Am Sup—April 7, 1906. No. 75933.

## Nozzles.

Experiments Upon the Flow of Gases in the Laval Type of Nozzle (Untersuchung der Gasströmung in der Laval Düse). Adolf Langrod. A study of experiments in cases in which the pressure in the most contracted portion is higher than the critical value. Two articles. 4000 w. Zeit-schr d Oesterr Ing u Arch—Oct. 20, 27, 1905. No. 73328 each D.

## Piezometer.

A Direct Reading Nozzle Piezometer. F. B. Sanborn. Illustrates and describes a device for measuring the pressure and quantity of water that is being delivered by a fire stream or other flowing jet. 1000 w. Eng News—Sept. 13, 1906. No. 79168.

## Pitometer.

The Pitometer and Its Uses. Edmund M. Blake. An illustrated description of

# MECHANICAL ENGINEERING

## Pitot Tube

this instrument and explanation of its uses in measuring the velocity of water in closed pipes. Discussion. 3000 w. Jour N Eng W Wks Assn—June, 1906. No. 77503 F.

## Pitot Tube.

Experiments with the Pitot Tube in Measuring the Velocities of Gases in Pipes. R. Burnham. A report of experimental investigations, describing the method used and presenting the results obtained as showing the practical accuracy of which the Pitot tube is capable. 2500 w. Eng News—Dec. 21, 1905. No. 73981.

A New Method of Reducing the Readings of the Pitot Tube—Comparison of the Weir and Pitot Tube. W. M. White. Presents a new method of working up the readings which leads to a large saving of labor. 1500 w. Am Mach—Vol. 29. No. 32. No. 78519.

## Planimeters.

The Theory of Planimeters. G. B. Upton. Aims to show that a theory of planimeters can be developed which shall be simple and general, with a minimum of mathematics. 1500 w. Sib Jour of Engng—Dec, 1905. No. 74551 C.

The Polar Planimeter and Some of Its Special Applications. J. Y. Wheatley. A brief description of the instrument, its construction and operation, explaining the general principle. 4500 w. Am Mach—Vol. 29. No. 29. No. 78053.

## Pyrometer.

The Fery Radiation Pyrometer. Illustrates and describes an instrument intended for the measurement of the temperature of furnaces of all kinds. 1500 w. Am Mach—Vol. 28. No. 46. No. 73217.

A Low Resistance Thermo-Electric Pyrometer and Compensator. Prof. William H. Bristol. Describes a thermo-electric pyrometer adapted for commercial and every day shop use. Also discussion. Ills. 12000 w. Am Soc of Mech Engrs, No. 090—May, 1906. No. 76110 C.

Improved Industrial Thermo-Electric Pyrometers (Nouveaux Pyrometres Thermo-Electriques Industriels). M. Piller. Describing a pyrometer of the Le Chatelier type, in which the thermo-electric couple is made of an alloy of copper, nickel, and manganese. 4000 w. Bull Soc Int des Electriciens—April, 1906. No. 76864 G.

## Radiation.

Recent Advances in Our Knowledge of Radiation Phenomena, and Their Bearing on Radiation Pyrometry. Read before the British Assn. On the use of radiation pyrometers and the principles upon which

## MEASUREMENT

## Slide Rule

they are founded. Ills. 1400 w. Elect'n, Lond—Aug. 17, 1906. No. 78247 A.

## Recording Apparatus.

The "Ados" CO<sub>2</sub> Recorder. Illustrated description of a device whereby the gases in boiler flues may be analyzed and recorded automatically and continuously, explaining the principle on which it works. 2000 w. Engng—Jan. 12, 1906. No. 74523 A.

## Screws.

Methods of Correcting Inaccuracies of Screw Threads. Illustrates and describes a method applicable to measuring apparatus, dividing machines, and other instruments of precision recently patented by J. E. Storey. 700 w. Mech Engr—April 14, 1906. No. 76196 A.

## Segments.

Curve for Determining Relation between Circle Diameters and Circular Segments. A. V. Youens. Gives curve and examples of its application in determining the area of a segment of a circle. 600 w. Power—Nov., 1906. No. 80076 C.

## Seismographs.

Feeling the Earth's Pulse. Reviews some of the theories advanced to explain earthquakes, and gives illustrated descriptions of some of the recording instruments for measuring the disturbance. 4000 w. Sci Am—April 28, 1906. No. 76380.

Seismograph Record of the San Francisco Earthquake. Waldon Fawcett. Describes and illustrates the seismograph in the United States Weather Bureau observatory at Washington, D. C., and its recording of earthquakes. 1000 w. Elec Rev, N Y—April 28, 1906. No. 76395.

European Earthquake Recorders. Illustrates some of the instruments used and work of Prof. Milne, of the Shide Seismographic Observatory in the Isle of Wight, and in Italian observatories. 1800 w. Sci Am—June 16, 1906. No. 77286.

## Shearing Stress.

Shear Stress and Permanent Angular Strain. W. C. Popplewell. Describes a series of experiments upon the torsional strength of solid and hollow shafts of cast iron, wrought iron and steel; and the results, so far as they relate to the elastic and ultimate strength properties of shafts, are discussed. 4000 w. Engr. Lond—Jan. 19, 1906. No. 74751 A.

## Slide Rule.

Short Cuts on the Slide Rule. Carl P. Nachod. Explains the use of the slide rule for calculations, showing its value. 900 w. Am Mach—Vol. 28. No. 46. No. 73216.

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## Speed Indicator

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### Speed Indicator.

The Frahm Speed and Frequency Indicator (Der Frahm'sche Frequenz und Geschwindigkeitsmesser). F. Lux. Illustrating the latest improvements in the Frahm indicator of vibrating springs; showing special receivers and transmitters for different speeds. 4000 w. *Glasers Annalen*—July 1, 1906. No. 78143 D.

### Speed Recorder.

Apparatus for Recording Rotative Speeds and Vibrations of Machines (Vorrichtung zum Aufzeichnen des Umlaufgeschwindigkeit und des Ungleichförmigkeitsgrades von Maschinen). Friedrich Lux. Describing the application of a recording device to the Frahm speed and frequency indicator. 2000 w. *Elektrotech Zeitschr*—June 14, 1906. No. 77653 B.

A Speed and Mileage Recorder for Automobiles and Railroads. A new type of recorder recently introduced in Great Britain is illustrated and described. It is said to be infallible in its operation. 1200 w. *Sci Am Sup*—May 12, 1906. No. 76633.

A Unique German Speed Gauge. F. C. Perkins. Illustrated description of a speed gauge for determining the speed of machines. It is an ingenious application of the property of resonance and was designed by Hermann Frahm. 700 w. *Min Rept*—May 3, 1906. No. 76538.

### Spring-Balance.

The Corrections to be Applied to the Readings of a Spring-Balance When Used Horizontally or on a Slope. Alfred Ernest Young. Discusses the corrections needed. 800 w. (No. 3532.) *Inst of Civ Engrs*. No. 73159 N.

### Springs.

Diagram for Computing the Dimensions of Springs (Rechentafel für Feder berechnung). Dr. R. Proell. A graphical diagram for helical springs, enabling the relations of dimensions, extension, compression, and load to be determined by direct measurement. 1200 w. *Zeitschr d Ver Deutscher Ing*—July 7, 1906. No. 78114 D.

The Calculations for Tension Springs for Electrical and Mechanical Apparatus (Berechnung von Zugfedern für Elektrische und Mechanische Apparate). Robert Edler. Applying the usual formulas to the light wire helical springs used in electrical work, with computed tables for various materials. Serial. Part I. 3000 w. *Elektrotech u Maschinenbau*—April 29, 1906. No. 76848 D.

### Standard Measures.

History of the Standard Weights and Measures of the United States. Louis A. Fischer. Address at meeting of the Sealers of Weights and Measures of the United States at the Bureau of Standards. 7000 w. *Am Mach*—Vol. 29. No. 2. No. 74317.

Method of Comparing Standard Measure Bars. Louis A. Fisher. Describes a simple process for deriving the yard from the meter bar. 1800 w. *Am Mach*—Vol. 29. No. 43. No. 80081.

### Standards.

Standards of Length. Herbert T. Wade. Information concerning the two meter bars in the custody of the National Bureau of Standards at Washington, and the care given them. Also the uses to which they are applied. Ills. 1200 w. *Sci Am*—March 10, 1906. No. 75429.

The National Bureau of Standards at Washington. Illustrations of the buildings and equipment used, with description of the work being done. 4000 w. *Am Mach*—Vol. 29. No. 20. Serial. 1st part. No. 76684.

### Steam Flow.

High-Speed Outflow of Steam and Gases. Robert H. Smith. Discusses the subject in connection with the design of turbines, developing in tables and diagrams the law connecting variation of velocity and of section with the gradual fall of pressure along the axial line of the flow. 3000 w. *Engr, Lond*—Dec. 22, 1905. Serial. 1st part. No. 74154 A.

### Straightedges.

How a Knife-edge Straightedge Was Made. F. N. Gardner. Describes some of the methods that led to success, and indicates "how not to do it." Ills. 2000 w. *Mach, N Y*—Nov., 1905. No. 72942 C.

### Strains.

Apparatus for the Study of Strains in Transparent Bodies by Polarised Light (Einrichtung für Versuche an Beanspruchten Durchsichtigen Körpern in Polarisiertem Licht). Otto Hönigsberg. With illustrations of apparatus for subjecting bodies of various shapes to stress while under visual inspection. 3000 w. *Zeitschr d Oesterr Ing u Arch Ver*—Aug. 31, 1906. No. 79329 D.

Stresses in a Rod Subjected to Combined Tension and Bending (Ein Fall des Eingespannten auf Zug und Biegung Beanspruchten Stabes). Ivan Arnovlevic. A mathematical discussion showing the applicability of hyperbolic functions to problems of this nature. 2500 w. *Zeitschr*

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d Oesterr Ing u Arch Ver—Aug. 24, 1906. No. 79328 D.

The Visibility of Neutral Planes in Strained Bodies (Ueber Direkte Sichtbarmachung der Neutralen Schichten an Beanspruchten Körpern). H. Siedentopf. Illustrating the application of polarized light to the observation of the internal distribution of strains in stressed bodies. 2000 w. Zeitschr d Oesterr Ing u Arch Ver—Aug. 17, 1906. No. 79326 D.

## Temperature.

Calculating Temperature Rises With a Slide Rule. Miles Walker. Describes a method which takes into account the changes of temperature coefficient with temperature. 600 w. Elec Jour—Nov., 1905. No. 73408.

## Thermometers.

Thermometers, Pyrometers, and Thermo-Regulators Operated by the Pressure of Saturated Vapors. Illustrates and describes apparatus of various types for exact determination of temperature. 4000 w. Sci Am Sup—Dec. 16, 1905. No. 73731.

## Time Recorders.

The Calculagraph. An illustrated description of this machine and its mechanism, and of the method of using it in factory time keeping. 2000 w. Am Mach—Vol. 29. No. 22. No. 77056.

The "Dey" Time-Register. Illustrated description of a machine for registering the time of employes. 2000 w. Engng—June 15, 1906. No. 77486 A.

## Torsion.

Tests on the Torsional Resistance of

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Bodies of Trapezoidal and Triangular Section (Versuche über die Drehungsfestigkeit von Körpern mit Trapezförmigem und Driekigem Querschnitt). C. Bach. Data and results of torsion tests upon prisms of various sections showing the relation of torsional and tensile strength. 1500 w. Zeitschr d Ver Deutscher Ing—March 31, 1906. No. 76203 D.

## Torsion Meter.

An English Torsion Meter. C. Smith. Illustrates and describes an instrument for finding the torsion of revolving shafts, and thus ascertaining the horsepower developed. 1400 w. Engr, U S A—Nov. 1, 1905. No. 73953 C.

## Tractigraph.

The Tractigraph, an Improved Form of Hatchet Planimeter. A. L. Menzin. Gives short discussion of the theory which governs the use of this instrument and an illustrated description. 2000 w. Eng News—Aug. 9, 1906. No. 78530.

## Vibrations.

The Measurement of Vibrations of Railway Cars. Frank C. Perkins. Illustrated description of the Sabouret pneumatic apparatus for the study of secondary movements on moving vehicles, in use in France. 1100 w. Ry Age—Dec. 29, 1905. No. 74008.

The Sabouret Apparatus for Testing the Vibrations of Rolling-Stock. Illustrated description of an apparatus for recording the vibrations and oscillations of railway rolling-stock. 1500 w. Engng—March 23, 1906. No. 75911 A.

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## Air-Compressors.

An Air-Compressor Test. John Howatt. Summary of a test made at Oelwein, Iowa. 900 w. Eng & Min Jour—March 24, 1906. No. 75662.

## Ball Bearings.

The Hoffmann Manufacturing Co.'s Patent Ball Bearings and Steel Balls. An illustrated description of the construction and application of their patent ball bearings. 1500 w. Prac Engr—Dec. 1, 1905. No. 73677 A.

## Bearings.

Bearings. A topical discussion. 3300 w. Pro Engrs' Soc of W Penn—Dec., 1905. No. 74066 D.

A Bearing for High-Speed Journals (Ein Lager für Hohe Zapfengeschwindigkeiten). F. Niethammer. Illustrating a

bearing arranged to be lubricated by oil under pressure as designed for the turbodynamo of the Alioth Company, of Basel, Switzerland. 1000 w. Zeitschr d Ver Deutscher Ing—Feb. 10, 1906. No. 75120 D.

Variation of Pressure in Bearings Due to Eccentric Loading. Gives a diagram devised to show the effects upon bearings of eccentric loading or unsymmetrical supports. 600 w. Am Mach—Vol. 29, No. 8. No. 75236.

The Lubrication of Bearings. A. M. Mattice. Practical matters in relation to the lubrication of bearings are discussed. 2000 w. Elec Jour—June, 1906. No. 77314.

Tests of Large Shaft Bearings. Albert Kingsbury. Illustrated description of the tests made and special apparatus used. 1000 w. Elec Jour—Aug., 1906. No. 78602.

# MECHANICAL ENGINEERING

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Friction and Lubrication. Prof. G. F. Charnock. Lectures before the Bradford Engng. Soc. A study of the laws of friction and scientific methods of lubrication, especially considering the friction of bearings for shafting and machinery. Ills. 2000 w. Mech Engr—Aug. 25, 1906. Serial. 1st part. No. 78095 A.

A New Turbo-Dynamo Bearing. Drawing and description of a high-speed bearing designed by Messrs. Alioth. 350 w. Elec Engr, Lond—Sept. 28, 1906. No. 79689 A.

See Marine and Naval Engineering.

## Belts.

A Contact Roller for Belts (L'Enrouleur de Courroies). J. Teisset. A discussion of the advantages of auxiliary pulleys for increasing the arc of contact of belts with pulleys. 7000 w. Mem Soc Ing Civ de France—Sept., 1905. No. 73336 G.

Belts and Belt Driving (Ueber Riemen und Riemetriebe). Fritz Krull. With tables of power transmitted, and illustrations of methods of driving. The construction and care of belts are discussed. Two articles. 7500 w. Zeitschr d Oesterr Ing u Arch Ver—Nov. 3, 10, 1905. No. 73331 each D.

The Care of Belts. C J. Morrison. Gives simple rules for the care of belts. Ills. 1200 w. Am Mach—Vol. 29. No. 36. No. 78971.

## Brakes.

Design of the Weston Load Brake. Ulrich Peters. Gives sectional views of one of the best mechanically designed brakes for cranes and other hoisting machinery and the calculations. 800 w. Mach, N Y—July, 1906. No. 77702 C.

## Cableways.

Kotagudi Aerial Ropeway and Connecting Roads in North Travancore. Richard Fenwick Thorp. Describes the Construction of a ropeway, a tramway, and a cart road to improve transportation in a mountainous portion of India. Ills. 4200 w. (No. 3524.) Inst of Civ Engrs. No. 73170 N.

The Aerial Ropeway at the Rother Vale Collieries. Illustrated description of a ropeway to carry 2-ton loads, recently put in operation. 1500 w. Ir & Coal Trds Rev—Oct. 27, 1905. No. 73013 A.

A New Design of Aerial Tramway. George K. Davol. Illustrates and describes a wire rope aerial tramway recently installed at the mines of the American Magnesite Co., in Santa Clara County, Cal., which has a length of a little more than half a mile, and a fall be-

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tween terminals of 650 feet. 4400 w. Jour of Elec—Feb., 1906. No. 75057 C.

## Chain Belts.

History of the Link-Belt Industry. James M. Dodge. An illustrated review of the development. 3000 w. Ind Wild—June 28, 1906. No. 77749.

## Clutches.

The Location and Use of Friction Clutches. W. H. Wakeman. Considers the benefits of friction clutches, presenting points in regard to their proper use. Ills. 3000 w. Am Mfr—Feb. 8, 1906. No. 74922.

Friction Clutches and Their Functions. An illustrated article, the present number explaining the construction of the ordinary cone clutch, the reversed cone clutch, cone clutch with split ring, and the expanding cylindrical ring clutch. 1300 w. Automobile—June 28, 1906. Serial. 1st part. No. 77536.

## Coal Handling.

Coal Handling and Storage. Charles H. Parker. Read before the Assn. of Edison Ill. Cos. An illustrated description of the apparatus installed at the South Boston Plant of the Edison Illuminating Company. 4500 w. Cent Sta—Nov., 1905. No. 73111.

Coal Handling Plant at the Hoboken Terminal of the Lackawanna R. R. Illustrates and describes the two McMyler car dumping machines installed and their operation. 2800 w. Eng Rec—Dec. 9, 1905. No. 73670.

From Canal Barge to Boiler Furnace by "Bennis" Automatic Machinery. Illustrates and describes several plants where this machinery has been installed. 3500 w. Ir & Coal Trds Rev—Jan. 12, 1906. No. 74531 A.

Tests of the Coal-Handling Plant at Breslau (Versuche an der Kohlenumladeanlage in Breslau). O. Kammerer. Detailed description and report of tests of cantilever coal-handling plant with diagrams from recording wattmeter and details of capacity and cost of operation. 4000 w. Zeitschr de Ver Deutscher Ing—July 7, 1906. No. 78111 D.

Transporter Cranes at Purfleet. Illustrated description of two rapid working hydraulic transporter cranes with grab-buckets, designed for lifting coal. 500 w. Engr, Lond—July 20, 1906. No. 78320 A.

## Compressed Air.

A Central Compressed Air Power Plant for Heavy Railroad Construction. Lucius I. Wightman. Description, with illustrations, of the central station located near

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Safe Harbor, for carrying on extensive railway work on the low grade freight line of the Pennsylvania R. R. 3000 w. Eng Rec—Oct. 28, 1905. No. 72904.

A Central Compressed Air Power Plant for Heavy Railroad Construction. Lucius I. Wightman. Illustrates and describes the plant for carrying out the heavy work on the low-grade freight line of the P. R. R. near Safe Harbor, Pa. 2500 w. Compressed Air—Nov., 1905. No. 73735.

Air Power in the Union Pacific Shops at Omaha, Neb. Illustrates and describes some of the applications of compressed air. 1000 w. Mod Mach—Dec., 1905. No. 73698.

An Air-Compressor Test. John Howatt. Gives a brief summarization of a test made at the Chicago & Great Western Railway shops at Oelwein, Iowa. 900 w. Power—Jan, 1906. No. 74128 C.

Compound Air Compression. Lucius I. Wightman. Considers the two practical methods in use for removing the heat of compression-jacket cooling, and intercooling. The gain of compound compression is discussed. 4000 w. Power—Jan, 1906. No. 74130 C.

Compound Air Compression. Lucius I. Wightman. Considers jacket cooling and intercooling, multistage compression, &c. 4200 w. Am Mach—Vol. 29, No. 5. No. 74818.

Derivation of Formulæ for Single and Stage Compression, also Proof of Conditions Governing Best Proportioning and Highest Economy in Stage Compression. Edward F. Schaefer. Shows how the formula for horse-power is developed. 1200 w. Sib Jour of Engng—Jan., 1906. Serial. 1st part. No. 74796 C.

Tests of Small Compressors. Max Kurth. Illustrated descriptions of complete methods used for determining the efficiencies of small air compressors running at high speeds. 2800 w. Mines & Min—Feb., 1906. No. 74935 C.

Motor-Driven Air-Compressor. Illustrates and describes two air-compressors constructed by Messrs. Reavell and Co., Ltd. One to work an air-lift pump; the other to charge the air-reservoirs used in starting the Diesel oil-engine. 1300 w. Engng—April 13, 1906. No. 76301 A.

The Bursting of Metal Chambers Under Internal Air Pressure. L. H. Chandler. Information compiled from records of the Bureau of Ordnance which is applicable to other than torpedo-flasks. Ills. 2800 w. Jour Am Soc of Nav Engrs—Feb., 1906. No. 76347 H.

Vertical Compound Two-Crank Inter-

Cooling Air-Compressor. Detailed drawings, with description of two powerful air-compressors, each driven by a 400 h. p. gas engine. They supply air for various pneumatic tools, and also operate hammers in a smithy and forge. 1500 w. Engng—April 6, 1906. No. 76081 A.

Modern Methods of Rock Excavation. Describes the work accomplished by well drilling machines operated by compressed air on heavy contract work. Ills. 1700 w. Compressed Air—June, 1906. No. 77153.

The Comparative Merits of Air and Electric Drills. Granville E. Palmer. Considers the electric apparatus unsuited to this work. 800 w. Compressed Air—June, 1906. No. 77152.

Compressed Air as a Motive Power in the Quarry. George H. Gillman. Remarks on the applications of compressed air to quarry work, discussing some drawbacks and the remedies. 1000 w. Compressed Air—July, 1906. No. 77766.

German Designs of Air Compressors. M. Kurth. Illustrates and describes some of the more important designs, and those of particular interest. 2200 w. Am Mach—Vol. 29. No. 30. No. 78228.

Recent Extensions of the Employment of Compressed Air. Frank Richards. Notes on the development of the return-air pumping system, the electric-air rock drill, and the high pressure transmission of artificial gas. 2200 w. Eng News—July 26, 1906. o. 78231.

The Air Power Plants of the East River Tunnels of the Pennsylvania Railroad. An illustrated detailed description of these stations and their equipment. 5000 w. R R Gaz—July 27, 1906. No. 78264.

How Horizontal Runs Affect the Air Lift. Herbert T. Abrams. Discusses one of the limitations of the air lift system of pumping, giving some experiments made by the writer. Ills. 1000 w. Compressed Air—Aug., 1906. No. 78592.

Hydraulic Air Compressing Machinery (Hydraulische Luft Kompression-sanlagen). P. Bernstein. An examination of modern air compressors of the "trompe," or water column type, with practical examples in Europe and America. 3000 w. Glückauf—July 21, 1906. No. 78741 D.

Intercoolers for Air Compressors. H. V. Haight. Diagrams of tests made and conclusions drawn from them, with information concerning intercoolers made. 1000 w. Am Mach—Aug. 30, 1906. No. 78887.

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Taylor Air Compressor at Victoria Mine. Arthur L. Carnahan. Illustrated description of this hydraulic air compressor, installed at this copper mine in Michigan. It operates automatically and is said to be the most powerful air compressor ever constructed. 3000 w. Min Wld—Aug. 25, 1906. No. 78824.

The Compressed Air Plants Used in Boring the East River Tunnels of the Pennsylvania Railroad. Describes the systems of air power production installed to handle the subaqueous work of the East River tunnels. Ills. 4000 w. Eng News—Aug. 2, 1906. No. 78396.

Air Compressors. Discusses the requirements, and gives illustrated descriptions of the important features in the designs of various makers. 15700 w. Engr, Lond (Sup)—June 15, 1906. No. 77484 A.

Compressed Air. Lucius I. Wightman. Brief review of the history, with discussions of its production, transmission and application. General discussion. 16500 w. Pro Engrs' Soc of W Penn—June, 1906. No. 77299 D.

Air Compressing Plants for the North River Tunnels of the Pennsylvania R. R. Frank Richards. Illustrated description of the plants constructed to carry on this great work. 2200 w. Eng Rec—Oct. 13, 1906. No. 79784.

Selection of Proper Air Compressor. Joseph D. Cone. Discusses the economic and mechanical considerations influencing the purchaser. Ills. 3300 w. Mines & Min—Oct., 1906. No. 79628 C.

Vacuum Peculiarities. Edward F. Schaefer. Discusses points in the maintaining of vacuums, the single stage and two-stage compression, etc. 1400 w. Compressed Air—Oct., 1906. No. 79738.

## Cone-Pulley.

Cone-Pulley Design. John Edgar. Gives as simple a method as possible for so designing cone-pulleys that their ratios shall advance in geometrical progression. 1400 w. Am Mach—Vol. 28, No. 50. No. 73767.

Five-Step Cone Pulleys for Lathes (Antrieb von Drehbänken mittels Fünfstufiger Wirtel). W. Hansen. Giving computations for securing a uniform ratio of speed changes in connection with back gearing. 1500 w. Zeitschr d Ver Deutscher Ing—July 21, 1906. No. 78706 D.

## Conveying.

Conveying Coal to the Boilers. Describes methods installed at different plants giving an illustrated description

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of a flight conveyor. 700 w. Eng & Min Jour—Aug. 18, 1906. No. 78635.

## Conveyors.

Cable Conveyors in Mining and Workshop service. (Schwebetransporte in Berg und Hüttenbetrieben). G. Dieterich. A fully illustrated description of the increasing use of conveyors and cableways in mining and manufacturing industries. Serial. Part I. 4000 w. Stahl u Eisen—April 1, 1906. No. 76229 D.

Mail Conveying Apparatus at the New Chicago Post Office Building. Illustrated detailed description of a very complete equipment for the handling of mail. 1500 w. Eng News—April 5, 1906. No. 75950.

Improved Hoisting and Warehousing Equipment in Bremen (Neuere Förder und Lageranlagen in Bremen). M. Buhle. A combination plant for handling grain in bulk and also merchandise in sacks and other packages. 1500 w. Zeitschr d Ver Deutscher Ing—Jan. 6, 1906. No. 74608 D.

The 30-Ton Conveyor in the Port of Breslau (Die 30-t Entlade Anlage für Massengüter im städtischen Hafen zu Breslau). M. Buhle. Overhead cantilever trestle work, traveling crane and conveyor for handling merchandise in bulk. 1200 w. Glückauf—Dec. 23, 1905. No. 74653 D.

Coal-Handling Plant of the Long Island City Power House of the Pennsylvania Railroad. An illustrated article dealing in detail with the coal and ash-handling equipment of this station. 4000 w. Power—June, 1906. No. 76751 C.

Elevating and Conveying Machinery. S. F. Joor. Illustrated descriptive review of various types of this class of machinery both for carrying articles in bulk and for carrying packages of various kinds. Also discussion. 1200 w. Jour W Soc of Engrs—April, 1906. No. 76930 D.

Mechanical Handling of Coal, Ashes, and Clinker, at the Electricity Station, Ivry, of the Paris-Orleans Railway. The arrangement for automatic coaling and mechanical stoking is illustrated and described. 1800 w. Ir & Coal Trds Rev—May 18, 1906. No. 77025 A.

The Automatic Conveyor in Lumbering. Day Allen Willey. Illustrates and describes conveying machinery used in connection with lumbering, saw-mills, pulp factories, and other wood-working establishments. 900 w. Sci Am—May 5, 1906. No. 76497.

The Belt Conveyor. Harold Sumner Farnham. From a lecture before the Mech. Engrs' class of 1906. Explains



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the fundamental principle of the belt conveyor, and illustrates and describes apparatus. 4500 w. *Harvard Jour of Engng*—June, 1906. No. 77332 D.

A Novel Cableway System of Coal Storage. Illustrated description of a new plant at Fall River, Mass., having a capacity of 20,000 tons, and the special type of cableway installed. 1500 w. *Eng Rec*—Sept. 15, 1906. No. 79163.

Recent American Improvements in Conveyors (*Neuerungen im Amerikanischen Transportmaschinenbau*). Georg von Hanffstengel. An illustrated review of improvements in bucket and belt conveyors and similar appliances, with especial reference to American practice. Serial. Part I. 4000 w. *Zeitschr d Ver Deutscher Ing*—Aug. 25, 1906. No. 79307 D.

Unloading-Bridges at Emden Outer Harbor. Illustrates and describes two electrically driven loading and unloading travelling bridges, for the rapid handling of coal, iron ores, and other goods in bulk. 900 w. *Engng*—Aug. 24, 1906. No. 79010 A.

## Costs.

The Comparative Cost of Steam Engines, Steam Turbines, and Gas Engines for Works Driving. Reviews the comparative cost tables given by W. Schömburg in *Elektrotechnische Zeitschrift*. Ills. 1500 w. *Elec Rev, Lond*—Sept. 7, 1906. No. 79221 A.

## Cranes.

A Fifty-Ton Electric Crane. Illustrated description of the mammoth electric crane for the new graving dock at Southampton. 900 w. *Sci Am Sup*—Nov. 25, 1905. No. 73416.

An Interesting 40-Ton Block-Setting Crane for Harbor Construction. Illustrated description of a crane with a radius of 115 feet, recently built in Great Britain for the construction of the harbor at Table Bay in South Africa. 900 w. *Sci Am Sup*—Nov. 4, 1905. No. 72972.

Electric Cranes. Claude William Hill. States the requirements where large quantities of material must be handled, and the advantages of electrical driving, discussing the worm-gear, bearings, motors and controllers, etc. Diagrams. 4800 w. (No. 3515.) *Inst of Civ Engrs*. No. 73179 N.

Electric Traveling Crane at the Liège Exposition (*Elektrisch Betriebener Laufkran auf der Weltausstellung in Lüttich, 1905*). Andreas Stamm. Illustrated description of 30-ton traveling crane of 79

feet span. 1200 w. *Zeitschr d Ver Deutscher Ing*—Nov. 11, 1905. No. 73324 D.

Locomotive Cranes as Labor Savers. Lewis Glasgow Howlett. Illustrates and describes some of these cranes and their operation, and the uses to which they have been applied. 2500 w. *Cassier's Mag*—Nov., 1905. No. 72987 B.

The Wharf Cranes of the Pennsylvania Railroad Company at Greenville, N. J. John Lyle Harrington. Illustrations, with detailed description of cranes for handling freight, both bulk and package, between the railway cars and the vessels. 3000 w. *Can Soc of Civ Engrs*—Nov. 16, 1905. No. 73746 D.

Cranes Driven by Single-Phase Motors. Illustrates and describes a four-ton single-phase electric travelling wharf-crane installed at Cologne, Germany. 1000 w. *Engng*—Dec. 22, 1905. No. 74150 A.

4-Ton Hydraulic Wharf Crane. Illustrated description of a crane being built for the Port of Antwerp. 500 w. *Engng*—Feb. 16, 1906. No. 75283 A.

The Electric Travelling Crane. States the advantages of electric cranes, and explains the methods of applying electricity, and the advantages of each. 2000 w. *Elec Engr, Lond*—Jan. 26, 1906. No. 74875 A.

Some German Electrically-Operated Cranes. Dr. Alfred Gradenwitz. Illustrates and describes some typical cranes, the electrical part of which was designed by the Siemens-Schuckert works. 1200 w. *Sci Am Sup*—April 28, 1906. No. 76381.

100-Ton Electric Derrick Crane at Scotts' Dock, Greenock. Illustrated description. 1000 w. *Engng*—April 27, 1906. No. 76572 A.

Locomotive Cranes. Percy R. Allen. An illustrated article discussing cranes of British and Continental make. 3000 w. *Cassier's Mag*—Sept., 1906. No. 79250 B.

Portable Turntable Cantilever Crane. Illustrated description of an interesting type built at Duisburger, Germany. 900 w. *Engr, Lond*—Sept. 28, 1906. No. 79713 A.

The Electric Crane in the Foundry. Harry Sawyer. Read at the A. F. A. Convention. Gives facts of interest in relation to the development and use of electric cranes in foundries, the types, and designs. 2500 w. *Foundry*—Oct., 1906. No. 79740.

## Drives.

Notes on Belt and Rope Drives. James Stormouth. Suggestions for efficient driv-

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ing. 2200 w. Engr, Lond—Dec. 22, 1905. No. 74155 A.

### Electric Driving.

A Discussion of the Various Systems of Electric Motor Driving. E. Kilburn Scott. Briefly considers belt driving, spur gearing, special cam gearing, worm gearing, chains, and friction gearing. Ills. 2400 w. Ir & Coal Trds Rev—Dec. 8, 1905. No. 73915 A.

Advantages and Applications of the Electric Drive. F. B. Crocker, and M. Arendt. Considers the one motor drive, group drive, and individual drive, and their proper application, and the advantages derived. Ills. 3000 w. Sch of Mines Qr—Nov., 1905. No. 74548 D.

Electricity in Cement Works. G. H. Oswald Strick. Describes the application of three-phase electric power to this class of work, and the process of manufacture. Ills. 2500 w. Elec Engr—Jan. 12, 1906. No. 74510 A.

Rough Notes on Electric Driving. Frank Broadbent. Discusses the rapid spread of electrical driving, its advantages, especially in the driving of printing machines. 1600 w. Elec Rev, Lond—Jan. 5, 1906. No. 74404 A.

Electric Power for Clay Plants from an Engineers' Point of View. Victor C. Vance. Read before the Nat. Brick Mfr's Assn. A consideration of the comparative merits of belt and electric transmission of power. 2500 w. Brick—May, 1906. Serial. 1st part. No. 76586.

Motor Drive in the Firth-Sterling Steel Company's Plant. Illustrated description of a typical installation of the Westinghouse direct-current motors, known as the S A type, in a new projectile shop at Demmler, Pa. 1500 w. Ir Age—May 31, 1906. No. 77029.

Electricity in Steel Works. An illustrated article showing the adaptability of the electric motor for the motive-power requirements of such works, especially the driving of live rolls. 2000 w. Elec Rec, Lond—Oct. 12, 1906. No. 80046 A.

Interesting Application of Motors to Existing Machine Tools. Illustrates and describes applications made in a Brooklyn factory where individual motor drive is employed. 3000 w. Elec Wld—Oct. 20, 1906. No. 80020.

Power Plant of the Western Banknote and Engraving Co. Illustrates and describes a modern motor-driven engraving plant. 1500 w. Engr, U S A—Oct. 1, 1906. No. 79597 C.

Some Economical Aspects of the Electric Drive. F. M. Feiker. Considers

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some of the benefits accruing from the installation of the electric motor drive in a factory. Ills. 1500 w. Cassier's Mag—Oct., 1906. No. 79529 B.

### Elevator.

The Electric Elevator on the Burgenstock (L'Ascenseur Electrique du Burgenstock). P. Chignaterie. An illustrated description of the tower and lift giving access to the high cliffs on the banks of the lake of Lucerne, Switzerland. 1000 w. Génie Civil—Oct. 21, 1905. No. 73309 D.

Tests of Elevator Plant in the Trinity Building, New York City. Arthur J. Herschmann. A report of commercial tests made while the plant was in regular operation. Tables. Ills. 1500 w. Trans Am Soc of Mech Engrs (No. 079)—Dec., 1905. No. 73443 C.

Tests of Elevator Plant in the Trinity Building, New York. Illustrates and describes the elevator system installed in this 20-story building, giving a report of the tests made. 2500 w. Eng Rec—Dec. 16, 1905. No. 73918.

Elevator Safeties at the Hotel Belmont. Describes the safety provisions for elevators operated at unusual heights and speeds. They are designed to carry 2,500 to 3,000 lbs. at a maximum speed of 500 ft. per minute. Ills. 2700 w. Eng Rec—May 19, 1906. No. 76738.

Electric Elevators. William Baxter, Jr. Describes elevator machines driven by electric motors, and illustrates several arrangements. 1800 w. Engr, U S A—June 1, 1906. No. 77081 C.

Some Notes on Braking Devices. Arthur W. Jones. On the reliability of the electro-magnetic brake, especially as applied to elevator gears. Ills. 1200 w. Elec Rev, Lond—June 15, 1906. No. 77475 A.

A Special Air Lift for Printing Press Service. A. W. Cochran. Illustrated description of an air-lift for supplying paper to a newspaper press, in Portland, Ore. 1000 w. Eng News—Dec. 7, 1905. No. 73629.

Electricity in Elevator Service. S. Morgan Bushnell. Discusses the relative advantages of electric and hydraulic equipments. 2500 w. Cassier's Mag—July, 1906. No. 78001 B.

Electric Passenger-Lifts for the Baker Street and Waterloo Railway. Illustrated detailed description of the elevators for this and other underground railways in England. Plate. 4800 w. Engng—Sept. 21, 1906. No. 79584 A.

### Elevator Equipment.

The Electrical Equipment of a Two-

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**Million-Bushel Grain Elevator.** Illustrates and describes the equipment of the operating elevator at Weehawken, N. J., belonging to the N. Y. C. & H. R. R. R. 1400 w. Elec Rev, N Y—March 17, 1906. No. 75560.

## Exposition.

**Power Machinery at the Reichenberg Exposition (Die Kraftmaschinen der Reichenberger Ausstellung).** Karl Rubricius. A brief notice of the steam engines, boilers, turbines, and combustion motors shown at the German-Bohemian exposition at Reichenberg. 2000 w. Elektrotech u Maschinenbau—Sept. 23, 1906. No. 79963 D.

**The Prime Movers at the German-Bohemian Exposition at Reichenberg (Die Kraftmaschinen auf der Deutschböhmischen Ausstellung in Reichenberg).** K. Körner. With illustrations and details of the steam engines and other prime movers at the Bohemian exposition. Serial. Part 1. 2500 w. Zeitschr d Ver Deutscher Ing—Sept. 15, 1906. No. 79900 D.

**Prime Movers of the Bavarian National Exposition at Nuremberg (Kraftmaschinen auf der Bayerischen Landesausstellung in Nürnberg).** H. Dubbel. Illustrating and describing numerous steam engines, boilers, turbines, and other power machinery exhibited. Serial. Part 1. 3500 w. 1 plate. Zeitschr d Ver Deutscher Ing—Sept. 29, 1906. No. 79902 D.

## Fans.

**Centrifugal Fans.** Thomas H. Johnson. Data on the performance of fans and a discussion of the influence of the structure or design, reporting tests. General discussion. Ills. 9500 w. Pro Engrs' Soc of W Penn—Nov., 1905. No. 73411 D.

## Fly Wheels.

**Exact and Approximate Methods of Fly-Wheel Computation (Die Genaue und die Angenäherte Schwungradermittlung).** Dr. R. Proell. An examination of the graphical and analytical methods of computing fly-wheel weights for given cylinder conditions. 2000 w. Zeitschr d Ver Deutscher Ing—Oct. 21, 1905. No. 73301 D.

## Friction.

**Tests of "Compo" Cork Insert Friction Plates.** John R. Nichols. Report of a test undertaken to determine the value of cork for increasing the frictional resistance of metallic surfaces in contact. 1000 w. Am Mach—Vol. 29. No. 23. No. 77217.

## Gas Transmission.

**A Proposition to Generate Gas on a**

## POWER AND TRANSMISSION

## Gearing

**Large Scale at Coal Mines and Transmit it Under Pressure for Light, Heat and Power.** Summary of papers by Arthur J. Martin, on the long distance transmission of gas, presented before meetings of British Scientists. 1200 w. Eng News—Oct. 4, 1906. No. 79623.

## Gearing.

**On the Location of the Pitch Circle in Worm Gearing.** Ralph E. Flanders. Points out the limitations to the recommendations made by Mr. Perrigo and Mr. Edgar. Ills. 2700 w. Mach, N Y—Nov., 1905. No. 72941 C.

**Diametrical and Circular Pitch.** From the *English Mechanic and World of Science*. Explains these terms and the recent changes in their use and application, and gives the methods of calculating under each system. 2800 w. Sci Am Sup—June 9, 1906. No. 77255.

**Planetary Gears.** Andrew Strom. Illustrates a number of arrangements of planetary gears, explaining their advantages, and the formulas for obtaining the speed ratios. 1800 w. Am Mach—Vol. 29. No. 26. No. 77528.

**Worm-Gear Design.** A. M. Sosa. Presents a formula for computing the pitch and lead of a worm. 1400 w. Am Mach—Vol. 29. No. 22. No. 77060.

**Designing Spiral Gears.** F. J. Bostock. Explains a graphical method, without formulas and requiring as little knowledge of trigonometrical ratios as possible. 1700 w. Am Mach—Vol. 29. No. 4. No. 74824.

**Some Special Forms of Inside and Outside Gears.** Robert Sibley. Notes and formulas in regard to inside and outside gears with movable centers. 700 w. Am Mach—Vol. 29. No. 6. No. 74940.

**Speed-Change Gears.** A. M. Sosa. Illustrated examples of speed-change gearing, especially those that apply to feeds for machine tools. 1000 w. Am Mach—Vol. 29. No. 7. No. 75013.

**Worm Contact.** Robert A. Bruce. Calls attention to some of the more obvious omissions that have been overlooked in the experimental investigations of the actions involved in worm-gearing. Ills. 7500 w. Inst of Mech Engrs—Jan. 19, 1906. No. 74885 D.

**The Figuring of Gear Drawings.** L. D. Burlingame. Illustrates the standard method of figuring used by the writer, with other points in drafting-room practice. 1300 w. Mach, N Y—Aug., 1906. No. 78331 C.

**Worm Gear Design.** Robert A. Bruce. A criticism of the formula presented by

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## Governors

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A. M. Sosa. 1500 w. Am Mach—Vol. 29. No. 31. No. 78368.

Spiral Gears. H. B. McCabe. Discusses how to make the calculations and cut the gears, giving diagrams, and formulas. 1200 w. Am Mach. Vol. 29. No. 41. Serial. 1st part. No. 79766.

A Method of Procedure in the Design of Helical Gears. R. E. Flanders. Describes a method which the writer thinks reduces the most serious of this class of problems to its simplest elements. 3500 w. Mach, N Y—May, 1906. No. 76463 C.

## Governors.

Centrifugal Governors (Les Régulateurs à Force Centrifuge). L. Rith. A general study of the principles involved in the design of centrifugal governors for the speed regulation of prime movers. 10000 w. Mem Soc Ing Civ de France—Sept., 1905. No. 73334 G.

## Hoisting.

Steam Consumption of a Modern Hoisting Plant. S. Powell, Jr. Reports a test made to determine the average rate of steam consumption of a modern high-class direct steam-driven hoisting apparatus under ordinary working conditions, when hoisting ore from a vertical deep-level shaft. 2000 w. Eng & Min Jour—Sept. 15, 1906. No. 79185.

A Study of Hoisting Machinery (Etude sur les Appareils de Levage). L. Rousselet. A general study of cranes and other mechanical hoisting devices; the first instalment discusses electric traveling cranes. Serial. Part I. 2000 w. Revue Technique—Nov. 10, 1905. No. 73835 D.

## Hoists.

Lifts and Hoists. H. C. Crews. Abstract of a paper read before the Manchester Sec. of the Inst. of Elec. Engrs. Reports investigations and tests of an equal number of hydraulic and electric lifts as to energy, maintenance, total costs, etc. The commercial side of the subject mainly. 4000 w. Elect'n, Lond—April 20, 1906. No. 76441 A.

## Horse-Power.

What is Horse-Power? An elementary explanation of the term. Ills. 1700 w. Auto Jour—July 21, 1906. Serial. 1st part. No. 78295 A.

## Hotel Plant.

Power Plant of the Hotel St. Regis, New York. Illustrates and describes a very complete modern plant installed for service in a high-class hotel. 3000 w. Eng Rec—Sept. 8, 1906. No. 79034.

## Mechanical Plant.

Mechanical Plant of the First National Bank Building, Chicago. Illustrated de-

tailed description of a plant to serve a 16-story steel-cage office building. It will furnish electricity for power and lighting, elevator installation for operating 22 elevators, a refrigerating plant, and an extensive heating and ventilating equipment. 3000 w. Eng Rec—Sept. 22, 1906. No. 79427.

The Mechanical Plant of the Ford Memorial Building, Boston. Brief description of this 8-story, steel and brick building and its uses, with detailed description of the plant for ventilating, heating, lighting, elevator service and furnishing power for other machinery. Ills. 5500 w. Eng Rec—April 28, 1906. No. 76416.

## Pneumatic Tubes.

An Improved Pneumatic Tube System. Illustrated description of a new system recently put in operation on some new lines installed for the Postal Telegraph Co., New York City. 2000 w. Eng Rec—June 2, 1906. No. 77074.

## Power.

Power in Tall Office Buildings. Charles H. Benjamin. The article deals with American conditions, discussing especially the cost, and distribution. 3300 w. Cassier's Mag—Jan, 1906. No. 74464 B.

Modern Tendencies in the Utilization of Power. John J. Flather. A review of power developments in the United States which have made possible great economy in production. 4000 w. Engrs' Soc Univ of Minn—Year Bk, 1906. No. 77509 N.

## Power Comparison.

Comparison between Steam and Electric Power in the Imperial Printing Office in Vienna (Vergleichende Angaben über Dampfbetrieb und Elektromotorischen Betrieb in der K. K. Hof und Staatsdruckerei in Wien). Leopold Nowotny. With diagrams of power curves and coal consumption, showing the advantages of electric driving. 1800 w. 1 plate. Oesterr Wochenschr f d Oeffent Baudienst—June 9, 1906. No. 77625 D.

## Power Distribution.

See Electrical Engineering, Distribution.

## Power Plants.

The Development of Energy in Power Plants (Energie-Erzeugung in Kraftwerken). Karl Rubricius. A comparison of the reciprocating engine, steam turbine, and gas engine as prime movers for power stations. 2000 w. Elektrotech u Maschinenbau—Jan. 7, 1906. No. 74661 D.

The Lighting, Power and Steam Heating Plant of the Department of the In-

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## Power Plants

terior, Washington, D. C. J. S. Hill. Illustrated description of a small central plant serving several buildings. 1500 w. Power—Sept., 1906. No. 78880 C.

The Planning and Construction of the Power Plant. A. E. Dixon. The second paper treats of questions of location together with the subject of the storage and handling of the fuel. 4000 w. Engineering Magazine—Sept., 1906. No. 78777 B.

The Planning and Construction of the Power Plant. A. E. Dixon. The third paper discusses the actual machinery of steam generation; boilers, stokers, and chimneys, with numerous illustrations from the best modern practice. 5000 w. Engineering Magazine—Oct., 1906. No. 79386 B.

The Planning and Construction of the Power Plant. A. E. Dixon. The fourth paper treats of the practical phenomena of combustion, including the relative merits of natural and mechanical draft, combustion rates, etc. 4000 w. Engineering Magazine—Nov., 1906. No. 79996 B.

Primary Considerations in the Designing of Power Plants. A. E. Dixon. The introduction of a series covering broadly the entire subject of the power station. The present article considers the preparation of plans and the supervision of contracts. 3000 w. Engineering Magazine—August, 1906. No. 78197 B.

Power Generation and Utilization in Mining and Metallurgical Plants (Kraftgewinnung und Kraftverwertung in Berg und Hüttenwerken). Dr. H. Hoffmann. Discussing gas power driving electric transmission, and modern methods of utilizing power in mining operations. Serial. Part. I. 5000 w. Zeitschr d Ver Deutscher Ing—Sept. 1, 1906. No. 79308 D.

Mechanical Equipment of the Carnegie Library Building Extension, Pittsburg, Pa. View and plans of the building, with description of a plant involving electrical generating, heating and ventilating, refrigerating, elevator, vacuum sweeping, and air compressing apparatus, all of large capacity. 2800 w. Eng Rec—Oct. 20, 1906. Serial. 1st part. No. 79886.

The Power Plant of the Pittsburg Terminal Warehouse and Transfer Co. Briefly outlines the requirements of this extensive terminal warehouse, and illustrates and describes the power plant which is designed to serve it. 4000 w. Eng Rec—Sept. 29, 1906. No. 79556.

## Power Problem.

The Industrial Power Problem. W.

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B. Esson. Address to the Civil and Mech. Engrs. Soc., slightly condensed. Deals with cases where the power production is dependent upon some form of fuel, discussing its production and distribution, cost, etc. 3000 w. Mech. Engr—Oct. 13, 1906. Serial. 1st part. No. 80042 A.

## Prime Movers.

Prime Movers for Generators. W. H. Wakeman. An illustrated article calling attention to prime movers available for this purpose. Elec, N Y—Dec. 27, 1905. Serial. 1st part. No. 74008.

## Regulation.

The Influence of Elastic Connections upon the Regulation of Rotating Motors (Die Elastische Verbindung der Rotierenden Massen und ihr Einfluss auf den Regulierungsvorgang des Motors.) Philipp Ehrlich. A discussion of the mechanical problems of speed regulation, showing the influence of the torsional elasticity of shafts, couplings, etc., upon the regulation of heavy machinery. 4500 w. Zeitschr d Oester Ing u Arch Vei—March 9, 1906. No. 75736 D.

## Residence Plant.

Mechanical Equipment of the New Residence of Senator Clark in New York. Illustrated detailed description of the plant for a 7-story and basement stone structure, equipped with Turkish bath, swimming pool, refrigerators, elevator plant, indirect heating, air filters, temperature regulators, steam, etc. 6000 w. Eng Rec—July 7, 1906. No. 77837.

## Rope Drives.

Endless Wire-Rope Drives. William Hewett. A study of the devices used and means of obtaining the best results. Ills. 3000 w. Stevens Ind—April, 1906. No. 76098 D.

## Shafts.

The Strength of Shafts Subject to Small Forces Rhythmically Applied. Charles Chree, Capt. Henry Riall Sankey, and William Ernest Wyatt Millington. A study of the effects of longitudinal, and of torsional vibrations, illustrating by examples. 7800 w. Inst of Civ Engrs. (No. 3558.) No. 74368 N.

Continuous Beams or Shafts Having Three Supports. E. Wagner. Gives a table for use in determining the dimensions of a shaft having three supports, and formulas by means of which exact values may be found for conditions not specified in the table. 1000 w. Eng News—Oct. 11, 1906. No. 79718.

## Shafts

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## Sheaves

### Sheaves.

Sheaves for Wire Rope (Ueber Drahtseilscheiben). Siegfried Abt. Discussing the advantages of using some form of friction filling in the grooves of rope sheaves; comparing the relative value of wood, leather, and metallic fillings. 2000 w. Schweiz Bauzeitung—Sept. 15, 1906. No. 79971 B.

### Speed.

An Instantaneous Positive Speed Variator. H. F. Noyes. Illustrates a device designed for a small horizontal drilling and boring machine. 700 w. Am Mach—Vol. 29. No. 16. No. 76126.

### Speed-Changing.

Gear-Box Drives. H. T. Millar. Illustrates and describes several gear-box arrangements, some remarkable for the large number of changes obtainable, and others for the small number of gears in motion. 1100 w. Am Mach—Vol. 28, No. 50. No. 73768.

### Telpherage.

Electric Telpher for Conveying Coal. Illustrated description of the telpherage installation for conveying coal at the Bevan works of the Associated Portland Cement Mfrs., Ltd. 1500 w. Engng—July 13, 1906. No. 78217 A.

### Transporters.

Transporters in the Outer Harbor at Emden (Verladebrücken im Aussenhafen zu Emden). Illustrated description of two bridges and conveyors for transporting cargo between vessels and railways at Emden, on the North Sea coast of Germany. 1200 w. Zeitschr d Ver Deutscher Ing—Feb. 3, 1906. No. 75109 D.

### Unloaders.

Electrically Operated Ore Unloaders. Frank C. Perkins. An illustrated descrip-

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tion of the labor saving devices used at the docks of the steel companies on the Great Lakes. 1600 w. Min Rept—Dec. 7, 1905. No. 73664.

### Unloading.

Ore-Unloading by Machinery. Day Allen Willey. Many illustrations, with description of the new Hulett unloading apparatus recently placed in operation on the Great Lakes for unloading cargoes of ore and coal. 1200 w. Sci Am—Feb. 10, 1906. No. 74952.

### Wind Power.

The Electrical Value of Wind Power. Editorial Review of what has been accomplished in the electrical utilization of wind power. 1500 w. Sci Am—Nov. 18, 1905. No. 73203.

The Mechanical Effect Produced by Windmills (Sur le Travail Mécanique Fourni par les Moulins à Vent). M. Ringelmann. Data and results of tests upon a windmill used for pumping water. The velocity of the wind and the rotative speed of the wheel were recorded automatically. 1200 w. Comptes Rendus—Oct. 30, 1905. No. 73326 D.

Wind Power. E. Lancaster Burne. Discusses the important considerations in regard to the use of wind for power, giving illustrated description of types of mills and the uses to which they are applied, their regulation, performance, governing, etc. 3000 w. Cassier's Mag—Aug., 1906. No. 78571 B.

### Worm Drive.

The "Globoid" Worm Drive. Robert Grimshaw. Illustrated description of a new drive which has won success in Germany, for which is claimed 90 per cent. of useful effect. 400 w. Mach N Y—Dec., 1905. No. 73528 C.

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## Adiabatic.

The Meaning of Adiabatic. Aims to show that three meanings are given to the word "adiabatic," and that this both confuses and misleads. 3000 w. Engr, Lond—Dec. 15, 1905. No. 74053 A.

## Air Pumps.

Air Pumps for Marine Engines (Luftpumpen für Schiffmaschinen). C. Streb. A general study of air-pump design, with numerous examples of modern types, both connected to the engine and independently driven. Serial. Part I. 3500 w. Zeitschr d Ver Deutscher Ing—Dec. 2, 1905. No. 72805 D.

## Accessories.

Steam Plant Accessories. John T. Farmer. Presented before the Canadian Elec. Assn. Considers feed water, pipe coverings, fuel economizers, mechanical firing, draft, etc. Ills. 14400 w. Can Elec News—July 1, 1906. No. 78071.

## Agricultural Show.

The Royal Agricultural Society's Show at Derby. Description and illustrations of exhibits of steam engines, and gas and oil engines are given in the present number. 3000 w. Engng—June 29, 1906. Serial. 1st part. No. 77895 A.

## Auxiliary Plant.

The Steam Power Plant at Nötsch

# MECHANICAL ENGINEERING

## Balancing

(Die Dampfkraft anlage in Nötsch). Otto Neuburger. A description of the steam plant installed as an auxiliary to the hydraulic station of the lead mines at Nötsch in southern Austria, near Villach. 3500 w. Oesterr Zeitschr f Berg u Hüttenwesen—Aug. 11, 1906. No. 79337 D.

## Balancing.

Experiments Illustrating the Balancing of Engines. Prof. W. E. Dalby. Abstract of a paper read before the British Assn. Illustrations, with report of experiments illustrating the action of the forces. 700 w. Engng—Aug. 17, 1906. No. 78855 A.

## Boiler Appliances.

Improvements in Steam-Boiler Operation (Neuerungen im Dampfkesselbetriebe). Describing especially a filter for removing oil from feed water; also boiler cleaning appliances. 1200 w. Glückauf—Oct. 21, 1905. No. 73339 D.

## Boiler Compounds.

The Intelligent Use of Boiler Compounds. R. L. Frank. Describes a method that has proved efficient and inexpensive, and costs about 25 cts. a horsepower. Ills. 3000 w. Engr, U S A—June 15, 1906. No. 77367 C.

## Boiler Explosion.

Explosion of a Locomotive at the St. Lazare Station, Paris (Explosion d'une Locomotive aux Abords de la Gare Saint-Lazare, Paris). Ch. Frémont. With photographs of the fragments and a discussion of the probable manner and cause of an explosion which occurred July 4, 1904. 2500 w. Génie Civil—Oct. 21, 1905. No. 73310 D.

The Boiler Explosion on the "Bennington." An account of the accident which occurred July 21, 1905, on the Pacific Coast. Also reviews the investigation of the cause as given in the Report of the Court of Inquiry. 3300 w. Locomotive—Jan., 1906. No. 75538.

## Boiler-House.

Boiler-House Economy. A. W. Bennis. Abstract of a paper before the Engng. Soc., Huddersfield. Discusses points that require attention to prevent losses. 2800 w. Ir & Coal Trds Rev—Dec. 8, 1905. No. 73914 A.

## Boiler Plant.

The Central Boiler Plant of the Pullman Car Shops. Describes and illustrates a new plant recently put into operation at Pullman. Ills. 3000 w. Eng Rec—Aug. 4, 1906. No. 78445.

## Boiler Power.

Boiler Power for Lighting and Power

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## Boilers

Plants. Charles L. Hubbard. Gives a method of estimating quickly the boiler power required for heating, lighting or power purposes, giving results of sufficient accuracy for all practical purposes. 2000 w. Am Elect'n—Dec., 1905. No. 73567.

## Boilers.

Some Notes on Steam Boiler Troubles. Horace See. Shows how some of the troubles can be directly traced to bad design and points out the characteristics found responsible for their occurrence. 2 plates. 2000 w. (No. 10). Soc Nav Archts & Marine Engrs—Nov. 16, 1905. No. 73192 C.

The Dürr Water-Tube Boiler in H. M. S. "Roxburgh." Illustrations with description and report of trials. 1600 w. Engng—Nov. 3, 1905. No. 73132 A.

Boiler Corrosion. W. H. Booth. Illustrated explanation of defects found in shell boilers, where faults of construction made the action of corrosion especially dangerous. 1400 w. Power—Jan, 1906. No. 74126 C.

Safe Boilers. Roger Atkinson. A review of the development of steam boilers, discussing the elements of destruction, types, etc. 4500 w. Ry & Loc Engng—Jan, 1906. No. 74198 C.

Water Tube Boiler Designing as a Science. Elbridge Gary Robberts. Discusses points in the designing of these boilers to meet the requirements of marine practice. 1800 w. Marine Rev—Jan. 4, 1906. No. 74239.

Steam Boiler Efficiencies. John B. C. Kershaw. Gives tests obtained under working conditions showing that gains in evaporative efficiency are possible, and describing devices and new forms of construction. 2000 w. Power—Feb., 1906. No. 74900 C.

Boiler Efficiency Tests. George T. Hanchett. Describes methods of making these tests, which the writer has found convenient. 2500 w. Elec Wld—March 3, 1906. No. 75355.

Large Locomotive Boilers. G. J. Churchward. Gives 16 plates of boiler designs, with a short paper discussing recent improvements and present practice. 2500 w. Inst of Mech Engrs—Feb. 16, 1906. No. 75308 D.

Boiler Incrustation. M. Fletcher. Read before the British Columbia Assn. of Sta. Engrs. Discusses scale and the remedies, corrosion, etc. 1500 w. Engr, U S A—April 16, 1906. No. 76128 C.

Boiler Setting. C. L. Hubbard. An illustrated article considering especially

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horizontal tubular boilers. 900 w. Engr, U S A—May 15, 1906. Serial. 1st part. No. 76744 C.

Double-Ended Water-Tube Boiler. A report of the experimental tests made with the double-ended Yarrow boiler. 1200 w. Engng—April 27, 1906. No. 76574 A.

Horse Power of Boilers. Roger Atkinson. An explanation of methods of calculating. 800 w. Ry & Soc Engng—June, 1906. No. 77102 C.

Steam Boilers at the Liège Exposition (Ueber das Dampfkesselwesen auf der Weltausstellung zu Lüttich). With illustrations of the various boilers exhibited, including also superheaters and boiler attachments. 3500 w. Glückauf—April 21, 1906. No. 76822 D.

Steam Boiler Inspections. Frank R. Fairweather. The various types of steam boilers in common use are considered, the causes of boiler explosions, and the importance of frequent inspections. Ills. 5000 w. Ins Engng—June, 1906. No. 77498 C.

The Hot-Air Boiler. Describes a pressure-generating device, known as a thermo-dynamic generator, explaining its action. 1200 w. Sci Am—June 16, 1906. No. 77284.

A Sectional Fire-Tube Boiler (Chaudière Ignitubulaire à Eléments Amovible). Ch. Dantin. An illustrated description of the Bourdon steam boiler, in which the fire tubes are formed by adjacent channels in the water sections. 2000 w. Génie Civil—July 14, 1906. No. 78716 D.

A Systematic Method of Starting Up and Shutting Down Steam Boilers. W. H. Wakeman. Describes the plan adopted in the writer's practice, giving the satisfactory results. 1400 w. Power—Sept., 1906. No. 78881 C.

Boiler Settings. C. L. Hubbard. Discusses grates, back connections, boiler covering, buck staves, supporting boilers, and economizers. 2500 w. Engr, U S A—Aug. 1, 1906. No. 78373 C.

Blowing Down Boilers. W. H. Wakeman. An illustrated article considering neglected points in the care and operation of boilers. 2000 w. Power—Dec., 1905. No. 73706 C.

Boiler Inspection and Explosions. A. S. Atkinson. On some of the methods of inspection used by the steam boiler insurance companies. 2200 w. Boiler Maker—Dec., 1905. No. 73639.

Care, Use, and Design of Locomotive Boilers. Two papers, by George Austin.

and by J. J. Malone, discussed together. 10400 w. Pro Pacific C Ry Club—Dec. 16, 1905. No. 73970 C.

Notes on the Performance of the Thornycroft Boiler in a Monitor. W. T. Cluverius. An account of the performance of the boilers of the harbor-defence monitor Arkansas. 1500 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73949 H.

Specification for Horizontal Tubular Boiler and Boiler-Room Equipment. Charles L. Hubbard. Gives a "dummy" useful in making up specifications for tubular boilers and their settings. 4500 w. Power—Dec., 1905. No. 73702 C.

The Care of Boilers. M. E. Wells. A discussion of the causes of leaks in boilers and the remedies. Ills. General discussion. 18000 w. Pro W Ry Club—Nov. 21, 1905. No. 73969 C.

The du Temple Water-Tube Boiler (Les Generateurs à Tubes d'Eau Système du Temple). H. Lassaux. Describing the general design of the du Temple small-tube boiler, with tabulated tests on French and Russian torpedo boats. 3500 w. Revue Technique—Nov. 10, 1905. No. 73836 D.

Some Essentials in Locomotive Boiler Design. D. Van Alstyne. Read before the N.-W. Ry. Club. Discusses points of importance in securing reliability and efficiency. General discussion. 3300 w. R R Gaz—July 20, 1906. No. 78059.

Water-Tube Boilers for Marine Service. William Ledyard Cathcart. A lecture before the Naval Archt. Soc. of the Mass. Inst. of Tech. Considers the effect of water-tube boilers on heat transmission, their requirements for marine service, gives details of construction of the Babcock & Wilcox marine boiler, tests, etc. Ills. 7500 w. Tech Qr—June, 1906. No. 78006 E.

Boiler Horse-Power. N. A. Carle. Gives charts which enable one to find without calculation the horse-power developed and the evaporation necessary to generate a given horse-power. 1000 w. Power—Nov., 1906. No. 80078 C.

Note on the Tightness of Foundation Rings. O. Busse. Considers the foundation rings in connection with locomotive boilers, showing that double-riveting is a disadvantage as regards tightness, and recommends a single row of rivets and deepened at the corners, the outer shell being fixed to the ring at those points, by about eight rivets. 900 w. Bul Int Ry Cong—Sept., 1906. No. 79889 E.



# MECHANICAL ENGINEERING

## Boiler Tests

Notes on the Working of Water-tube Boilers. R. Somerville Bayntun. Gives the writer's experience with various types of water-tube boilers, describing tests which proved of value in keeping the boilers in good condition. 1800 w. Elec Rev, Lond—Oct. 12, 1906. No. 80047 A.

See Mechanical Engineering, Materials.

See Railway Engineering, Motive Power.

## Boiler Tests.

Hydraulic Tests. William H. Fowler. Describes these tests for boilers and other vessels subject to steam pressure, giving hints for conducting them, and the information obtained. 1600 w. Mech Engr—Dec. 2, 1905. No. 73678 A.

## Breakdowns.

Engine Breakdowns and Their Lessons. Michael Longridge. Abstract of report of the chief engineer in the British Engine, Boiler, and Electrical Insurance Co., Ltd., for the year 1905. 4000 w. Mech Engr—Sept. 29, 1906. Serial. 1st part. No. 79683 A.

## Chimney Gases.

The Removal of Dust and Smoke from Chimney Gases. S. H. Davies, and F. G. Fryer. Read before the British Assn. Describes the experiments in progress for cleansing the exit gases, and gives a note on the supposed elimination of sulphur-dioxide from chimney gases by treating the fuel with lime water. Ills. 3000 w. Elec Engr, Lond—Aug. 10, 1906. No. 78668 A.

## Chimneys.

See Civil Engineering, Construction.

## Circulation.

The Natural Circulation of Water in Boilers (Circulation Naturelle de l'Eau dans les Chaudières). M. Emanand. A general review of the theories of steam-boiler circulation, showing the necessity for further experimental researches. 4000 w. Génie Civil—July 28, 1906. No. 78720 D.

## Coal Handling.

See Mechanical Engineering, Power and Transmission.

## Combustion.

An Improved Automatic Recording Gas Tester. (Ein Neuer Selbstregistrierender Gasprüfer). S. Bourdot. Illustrating an improved recorder for showing the proportion of carbon dioxide in the flue gases from boiler furnaces, etc. 1800 w. Elektrotech u Maschinenbau—Sept. 30, 1906. No. 79966 D.

The Effect of Altitude upon Combustion. Charles M. Palmer. An explanation of why more fuel is required at

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high than at low altitudes. 1800 w. Power—Sept., 1906. No. 78878 C.

## Compression.

Efficiency in Compression in Steam Engines. Prof. Robert H. Smith. Discusses the most efficient limit of compression, the efficiency being measured by horse-power per unit quantity of steam used per hour. 2500 w. Engr, Lond—Nov. 3, 1905. No. 73135 A.

## Condensation

Condensers for Steam Engines and Turbines. Frank Foster. Points out the general principles underlying condenser design, showing how the working conditions affect the design; especially considering the most economical vacuum. Ills. 3500 w. Mech Engr—Oct. 28, 1905. Serial. 1st part. No. 72997 A.

The Efficiency of Condensers and Its Effect on Power Station Costs. R. M. Neilson. A commentary and corollary on Prof. Weighton's paper before the Inst. of Naval Archts. Considers the ways the total cost per unit generated is affected by the condensers. 1400 w. Elec Rev, Lond—June 15, 1906. No. 77477 A.

Condenser Construction. W. H. Booth. Remarks on tests reported in a recent paper by Prof. Weighton before the Inst. of Naval Archts. 1300 w. Power—Aug., 1906. No. 78329 C.

Condensation of Steam. An illustrated explanation of the four classes of apparatus commonly employed for condensing exhaust steam. The surface, atmospheric, jet, and barometric or siphon condenser. 6000 w. Special No. Engr, U S A—Jan. 1, 1906. No. 74326 D.

Condensers—Types and Application. Franz Koester. Illustrated descriptions of types and applications made of them. 2500 w. Power—Jan., 1906. No. 74132 C.

Some Points on the Management of Condensers. G. P. Wright. Suggestions for the care and management. 1600 w. Special No. Engr, U S A—Jan. 1, 1906. No. 74327 D.

Air in Relation to the Surface Condensation of Low-Pressure Steam. A report of experimental researches on the effect of gases—specifically atmospheric air—upon working efficiencies, showing that air should be rigorously excluded from high-grade surface-condensing installations. 4000 w. Engr, Lond—July 20, 1906. Serial. 1st part. No. 78322 A.

Experiments on Surface Condensation. James Alexander Smith. An experimental study of the influence of the presence of air in small quantities upon the surface condensation of low-pressure

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## Cooling Tower

steam. 7000 w. Engng—March 23, 1906. No. 75913 A.

Surface Condensers (Ueber Oberflächenkondensatoren) G. Hagemann. Developing formulas and diagrams for the proportions of condensers and air pumps for the maintenance of a determinate vacuum, in condensing a given volume of steam. 1000 w. 1 plate. Glückauf—March 24, 1906. No. 76239 D.

The Efficiency of Surface Condensers. Prof. R. L. Weighton. Read before the Inst. of Nav. Archts. Gives results from a very extensive series of trials which were of such a character as was thought might prove useful in the designing and proportioning of condensers generally. Ills. 3000 w. Engng—April 13, 1903. Serial. 1st part. No. 76304 A.

## Cooling Tower.

The Bourdon Multicellular Cooling Tower (Réfrigérant Multicellulaire des Eaux de Condensation, Système Ch. Bourdon). Ch. Dantin. The water trickles down through a column of hollow bricks against an ascending current of air. 1200 w. Génie Civil—Aug. 4, 1906. No. 78722 D.

## Corrosion.

Corrosion and Its Effects in Steam Boilers. William H. Fowler. The present number considers the corrosion of external surfaces. Ills. 1000 w. Mech Engr—March 10, 1906. Serial, 1st part. No. 75583 A.

The Preservation of Surface Condenser Tubes in Plants Using Salt or Contaminated Water Circulation. W. W. Churchill. Read before the Am. Assn. for the Adv. of Science. Reports investigations made with a view of discovering a method of protection. 3000 w. Power—Oct., 1906. No. 79460 C.

## Cost.

Elements Influencing the Cost of Steam Power (Was Beeinflusst die Kosten der Dampfkraft?). H. Fischer. Deriving diagrams for use in showing the relative influence of boiler proportions, superheating, condensing, and engine performance upon the cost of steam power. 1500 w. Zeitschr d Ver Deutscher Ing—April 28, 1906. No. 76804 D.

See Mechanical Engineering, Power and Transmission.

## Cylinders.

Calculating the Size of the Cylinders for a Multiple Expansion Engine. George Elfers. Illustrates, by example, the manner of solving this problem. 1700 w. Marine Engng—Jan., 1906. No. 74023 C.

## STEAM ENGINEERING

### Diagrams.

The Construction of Steam Diagrams (Konstruktion der Dampfdiagramme). Hr. Debye. An application of the investigations of Gütermuth upon the flow of steam through ports, to the study of the velocity of steam flow upon indicator diagrams. 2000 w. Zeitschr d Ver Deutscher Ing—Nov. 25, 1905. No. 73804 D.

### Draft.

Natural and Induced Draft. John W. Cobb. Read before the Yorkshire Sec. of the Soc. of Chem. Ind. An explanation of how a chimney does its work, and also a discussion of induced draft and its advantages. 2500 w. Prac Engr—Oct. 27, 1905. Serial. 1st part. No. 72993 A.

Chimney Draft and Forced Draft. J. W. Richards. Considers methods of calculating the theoretical total suction of a chimney, illustrating by problems and solutions. 3500 w. Elec-Chem & Met Ind—Feb., 1906. No. 74911 C.

Draft. Discusses the removal of the gaseous products of combustion, and the supplying of the proper amount of oxygen. Considers mechanical draft and when it is desirable. 3000 w. Power—July, 1906. No. 77525 C.

### Economy.

Economy in Steam Power Plants. R. J. Durley. Read before the Canadian Ry Club. Considers the conditions which are favorable to the economical generation of steam, and the factors that favor economy in its utilization. 4500 w. Can Elec News—Jan, 1906. No. 74480.

### Economy Test.

Economy Test of a Skinner Engine. Reports a test made by Prof. R. C. Carpenter under actual running conditions, giving the results. 1500 w. Power—July, 1906. No. 77523 C.

### Efficiency.

Efficiency of Steam Plant. Walter A. Vignoles. Reports an investigation of the coal consumption in a central station, giving tests made, and discussing results. 4000 w. Mech Engr—June 23, 1906. No 77784 A.

Efficiency of Steam Plant. Walter A. Vignoles. Read before the Incor. Munic. Elec. Assn., London. An analysis of the coal and steam consumption of a central station, with a view to showing where the losses are incurred and how they can best be reduced. Also discussion which includes Mr. Wilkinson's paper. 8000 w. Elect'n, Lond—July 6, 1906. No. 77972 A.

Variations of the Efficiency of Piston Engines with the Rotative Speed (Die

## Efficiency

# MECHANICAL ENGINEERING

## Engine Economy

Aenderung der Leistung von Kolbenmaschinen mit der Umlaufzahl). H. Lorenz. A study of the speed of maximum efficiency, showing the dependence of efficiency upon load, cut off, and rotative speed. 1800 w. Zeitschr d Ver Deutscher Ing—Aug. 11, 1906. No. 78714 D.

## Engine Economy.

Engine Economy as Affected by Unequal Cut-off. Thomas Hall. Investigations which tend to show that it is not necessary from the point of economy to have exactly equal adjustment of the cards for both ends of the cylinder, throughout the full range of cut-off. 1500 w. Power—July, 1906. No. 77517 C.

## Engine Rooms.

Cooling the Engine Rooms—and the Engineer. James F. Hobart. Explains ways by which an engine-room may be made fairly comfortable. 2500 w. Elec Wld—Aug. 4, 1906. No. 78455.

## Engines.

German Rolling Mill Engines and Their Design. An illustrated article discussing single cylinder engines, compound engines, and triple expansion engines. 1800 w. Ir & Coal Trds Rev—Nov. 3, 1905. Serial. 1st part. No. 73138 A.

600 Horse-Power Horizontal Tandem Compound Condensing Engine. Illustrated description of an engine for driving directly a Jaspard dynamo. The combined plant is ordered for the Mechlin Locomotive Works. 1500 w. Engr, Lond—Nov. 10, 1905. No. 73295 A.

A Notable Mesta Corliss Engine. Illustrated detailed description of the 44 and 72 x 60 inch horizontal-vertical Corliss compound engine built for the Tennessee Coal, Iron & R. R. Co. 2000 w. Ir Age—Dec. 21, 1905. No. 73939.

Machinery at the New Royal Naval College, Dartmouth. Illustrates and describes a triple-expansion engine, with independent surface condenser, air and circulating pumps, and all necessary tanks, pipes, &c., installed for the purpose of instructing young officers in the practical working of the steam engine. 1000 w. Engr, Lond—Dec. 15, 1905. No. 74054 A.

Six-Cylinder Compound Engine (Machine à Vapeur Compound à Six Cylindres). An illustrated description of a rolling-mill reversing engine of 10,000 h. p. at the Cockerill works at Seraing, Belgium. 1500 w. 1 plate. Génie Civil—Nov. 25, 1905. No. 73812 D.

Ten-Thousand Horse-Power Rolling-Mill Engine. Charles R. King. Illustrated description of the engine recently built

## STEAM ENGINEERING

## Engines

for operating the blooming and girder mills at Seraing in place of the small units hitherto employed. 1200 w. Mach, N. Y.—Jan, 1906. No. 74113 C.

Comparison Between Torpedo Boat and Merchant Marine Engines. Dr. Alfred Gradenwitz. An illustrated article comparing size, weight, &c., of engines of equal horse-power. 700 w. Sci Am Sup—Feb. 10, 1906. No. 74954.

Taking Care of an Engine. W. H. Wakeman. Calls attention to details the care of which will result in satisfactory service. Ills. 2000 w. Power—Feb., 1906. No. 74897 C.

A Heated Piston Engine. Charles R. King. Illustrated description of an engine built in Belgium and exhibited at Liège International Exhibition, explaining the objects of the steam distribution. 2000 w. Mach, N Y—April, 1906. No. 75876 C.

The Multiplication of Impulses. A. E. Ash. Reviews the development of the marine engine, showing the way the marine engineer has successfully multiplied the number of impulses and reduced the units of force. Ills. 1000 w. Autocar—April 21, 1906. No. 76431 A.

A New Vertical Steam Engine. George W. Heald. Illustrations and description of the special features of a new Bates engine. 1000 w. Engr, U S A—July 2, 1906. No. 77747 C.

High Power Steam Engines at Berlin. Illustrated description of engines and generators at the Moabit central station, Berlin, and at the Oberspree station. 1800 w. Engr, Lond—June 22, 1906. No. 77799 A.

Some Features of the Corliss Engine. W. H. Wakeman. Describes some features of these engines and some of the more important changes that have been made. Ills. 2300 w. Power—Oct., 1906. No. 79462 C.

Three-Cylinder Vertical Engine for Tyre Mills. Illustrations, with brief description of an engine designed especially for driving tyre and disc mills. 350 w. Engng—Sept. 14, 1906. No. 79450 A.

Small, Vertical, High-Speed Engines. F. R. Still. Gives a statement of the points aimed at in the design, and discusses the ways of securing them. Ills. 3000 w. Jour Assn of Engng Socs—May, 1906. No. 78587 C.

Two Large Tod Engines. Illustrates and describes the engines recently installed in the new Bessemer steel plant of the Youngstown Sheet & Tube Co. 1200 w. Ir Age—Aug. 9, 1906. No. 78480.

# MECHANICAL ENGINEERING

## Engines

The Influence of Moving Masses in the Steam Engine. (De l'Influence des Masses en Mouvement dans la Machine à Vapeur). A. Bauermeister. A study of the inertia action of the reciprocating parts and of the fly wheel for simple and compound engines. 6000 w. *Revue de Mécanique*—Aug. 31, 1906. No. 79919 E+F.

Thermal Phenomena in Steam Engines. (Les Phénomènes Thermiques dans les Machines à Vapeur). Armand Duchesne. Discussing experiments upon the heat interchanges in the cylinder walls. The temperatures were measured by imbedded thermo-electric couples. 12000 w. *Revue de Mécanique*—July 31, 1906. No. 79916 E+F.

Reciprocating Steam Engines vs. Steam Turbines. W. P. Hancock. Gives a comparison of operation between two power houses of modern type. 4500 w. *Cassier's Mag*—Oct., 1906. No. 79524 B.

Relative Economy of Turbines and Engines at Varying Percentages of Rating. Walter Goodenough. Read before the Am. St. & Int. Ry. Engng. Assn. Considers the economy in operation of individual units and also economy in their selection as affected by type and design. 3000 w. *Eng Rec*—Oct. 20, 1906. No. 79883.

Rebuilding a Large Rolling Mill Engine. An illustrated description of the compounding of an engine in the South Works of the Illinois Steel Co., the success of the work of installation and the remarkable record made in the time of installation. 1500 w. *Engr, U S A*—June 15, 1906. No. 77366 C.

## Engine Tests.

Report of the Official Test of the Double Cross-Compound Engines in the Fifty-ninth Street Power Station of the Interborough Rapid Transit Company of New York. Gives a description of the conduct of the test proper and the subsidiary tests, classified as reported by the engineer in charge. 2500 w. *St Ry Jour*—Jan. 6, 1906. No. 74229 C.

## Entropy.

The Practical Aspect of Entropy. J. H. Hart. An explanation of the meaning and importance of entropy by analogy with other physical and mechanical relations. 3000 w. *Engineering Magazine*—July, 1906. No. 77687 B.

## Erection.

Suggestions for Erecting Engines. Sterling H. Bunnell. General suggestions, with points on setting templates, indicating, adjusting the governor, etc. 2800 w. *Power*—May, 1906. No. 76367 C.

## STEAM ENGINEERING

## Feed Water

### Exhaust Steam.

Increasing Profits of a Central Station. George E. Walsh. Calls attention to methods of economizing by utilizing exhaust steam, hot water circulating systems, etc. 2500 w. *Am Elect'n*—Nov., 1905. No. 73055.

Exhaust Steam Disposal. Explains the advantages and disadvantages of both high pressure and low pressure engines and why each has its use in practice, and discusses the increase in efficiency by condensing. Ills. 1800 w. *Engr, U S A*—Jan. 1, 1906. Special No. No. 74322 D.

The Rateau Exhaust-Steam Regeneration and Utilization Plant. An illustrated description of the plant installed at the Hallside Works of the Steel Co. of Scotland. 2200 w. *Engng*—June 29, 1906. No. 77893 A.

The Recovery of Power from Exhaust Steam (Kraftgewinnung aus Abdampf). Karl Rubricius. A discussion of various attempts to recover the energy rejected with the exhaust of steam engines with especial reference to the Rateau steam accumulator and low-pressure turbine. 4000 w. *Elektrotechnik u Maschinenbau*—June 24, 1906. No. 78170 D.

Utilizing Exhaust Steam in Low-Pressure Turbine Plant at Collieries. Hundt, in *Glückauf*. Illustrates and describes the plant at the Bruay collieries. The steam is derived from Rateau accumulators and discharged into high-vacuum condensers. 1600 w. *Col Guard*—April 27, 1906. No. 76569 A.

### Exposition.

Steam Boilers and Engines at the Görlitz Industrial Exposition (Die Dampfkessel und Dampfmaschinen auf der Niederschlesischen Gewerbe und Industrie Ausstellung Görlitz 1905). Dr. Förster. An illustrated review, describing water-tube boilers, steam fittings, and engines of recent German design. 4000 w. 1 plate. *Zeitschr d Ver Deutscher Ing*—Nov. 18, 1905. No. 73800 D.

### Feed Pumps.

Capacity of Duplex Boiler Feed Pumps. N. A. Carle. Gives a chart for selecting the size and number of duplex boiler feed pumps, operating at various piston speeds, explaining its use. 600 w. *Power*—Oct., 1906. No. 79463 C.

### Feed Water.

Feed-water Heating. An illustrated article considering the classes and types of feed-water heaters, the saving effected, and matters of related interest. 4200 w. No. 74323 D.

Water Softening for Boiler Use. T. W.

# MECHANICAL ENGINEERING

## Feed Water

Snow. A short paper and discussion on the need of removing scale forming substance from the water before it is fed to the boilers. Ills. 3300 w. Jour W Soc Engr, U S A—Jan. 1, 1906. Special No. of Engrs—Dec, 1905. No. 74555 D.

Separation of Oil from Feed Water. J. H. Harwood. Discusses methods of treatment for eliminating the emulsified oil from the feed water. 2000 w. Elec Rev, Lond—April 13, 1906. No. 76143 A.

The Art of Water Softening. C. Herschel Koyl. General discussion of the subject, and brief consideration of the lime treatment, the soda treatment, and the mechanical treatment. 2000 w. R R Gaz—June 8, 1906. No. 77225.

Feed Water Heaters in Connection with Heating Systems. William G. Snow. Read at meeting of the Am. Soc. of Heat & Vent. Engrs. An illustrated article pointing out certain features in the application of feed water heaters in connection with heating systems. 2000 w. Met Work—July 21, 1906. No. 78048.

Live-Steam-Heated Feed Water—Its Effect on the Output and Efficiency of Steam Boilers. G. Wilkinson. Read before the Incor. Munic. Elec. Assn. Discusses the increasing the capacity of boilers designed for high duty, the range of temperature in boiler water, the methods of heating feed water, experimental work, etc. 9500 w. Elec Engr, Lond—June 29, 1906. Serial. 1st part. No. 77884 A.

Feed-water Purification. R. T. Strohm. Considers the reasons for purifying feed-water and the methods. 2000 w. Elec Wld—Sept. 1, 1906. No. 78984.

Oil Extraction. A. B. Willets. Improvements in methods of extracting oil from feed-water for marine boilers. 1500 w. Ir Age—Sept. 13, 1906. No. 79152.

Feed-Water Heating. R. T. Strohm. Discusses the economy, safety and value of feed-water heating, and considers feed-water heaters. 2000 w. Elec Wld—Oct. 6, 1906. No. 79678.

## Fire Boxes.

Firebox Steel—Failures and Specifications. Max H. Wickhorst. Abstract of a paper read at meeting of the Am. Soc. for Test. Mat. Discusses the conditions of failures, temperature tests, mud accumulations, and specifications. 2000 w. Ry Age—June 29, 1906. No. 77733.

## Firing.

Is Machine Stoking Economical? Alfred W. Bennis. Abstract of a paper read

## STEAM ENGINEERING

## Forced Draft

before the Keighley Assn. of Engrs. Gives facts tending to prove the economy. 1700 w. Elect'n, Lond—Oct. 27, 1905. No. 73004 A.

The Burning of Fuel. Editorial on the burning of coal, especially in locomotives, and the effect of large grate area. 1000 w. Ry & Loc Engng—Nov., 1905. No. 72933 C.

Modern Practice for Firing Water Tube Boilers in Large Vessels. H. C. Dinger. Considers the proper conditions of firing, explaining system. 1800 w. Marine Engng—April, 1906. No. 75860 C.

Mechanical Stoking Economics. A. S. Atkinson. Does not consider automatic stokers a gain in plants smaller than 2000 h.p. capacity. Discusses the skill in hand firing, and in the handling of automatic stokers. 2500 w. Engr, U S A—July 2, 1906. No. 77748 C.

Modern Improvements in Firing Methods (Neuere Erfahrungen in Feuerungs betrieben). A. Blezinger. Describing especially improvements in the production and use of gaseous fuel for heating and boiler furnaces. 4500 w. Stahl u Eisen—June 15, 1906. No. 78145 D.

## Flanges.

High-Pressure Steam-Pipe Flanges. Franz Koester. Comments and description of types. Ills. 1700 w. Power—Dec., 1905. No. 73705 C.

## Flow.

The Flow of Steam Through Nozzles. An experimental study, discussing in some detail the results obtained in Mr. Rosenhain's experiments, as given in the Pro. of the Inst. of Civ. Engrs. 4000 w. Engng—Feb. 2, 1906. No. 74993 A.

## Flue-Gases.

A Portable Apparatus for the Analysis of Flue-Gases. Charles Joseph Wilson. Illustrates and describes an apparatus employed in all the trials carried out by the recent Admiralty committee on Naval Boilers, with good results. 1700 w. Inst of Civ Engrs. (No. 3580.) No. 74355 N.

## Flywheels.

An Example in Engine Flywheel Design for Electrical Driving. A. Houlson. Gives a practical example illustrating the dynamical principles which govern the design of flywheels viewed as regulators of speed. Diagrams. 2200 w. Mech Engr—Aug. 18, 1906. Serial. 1st part. No. 78838 A.

## Forced Draft.

Forced Draft for Boilers. L. J. Wing. Advocates the use of forced draft, and calls attention to some fan applications.

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## Fuel.

1000 w. Am Soc of Heat & Vent Engrs—Jan, 1906. No. 74338 C.

## Fuel.

The Utilization of Low Grade Fuels for Steam Generation. W. Francis Goodrich. A comparison of the theoretical value of high grade and low grade fuels on the basis of economy in money. 3500 w. Engineering Magazine—Dec., 1905. No. 73373 D.

Coal-Dust Firing. Eustace Carey. Abstract of a paper read at Liverpool before the Soc. of Chem. Ind. Reports the results that have been obtained with coal-dust firing, and the advantages. 1800 w. Eng & Min Jour—Dec. 16, 1905. No. 73773.

Comparative Heat-Producing Values of Different Fuels. Prof. Erasmus Haworth. Explains the method usually adopted for testing heat-producing qualities and gives results and general information. 3800 w. Pro Age—Dec. 15, 1905. No. 73759.

Crude Oil Burning. J. R. Collins. Points on the requirements for the successful use of this fuel. Ills. 800 w. Engr, U S A—Dec. 15, 1905. No. 73789 C.

Fuel Substitutes. Prof. Arthur Lakes. Some of the different materials utilized for burning in regions where ordinary fuels are unattainable are discussed. Ills. 1400 w. Mines & Min—Dec., 1905. No. 73713 C.

The Utilization of Low Grade Fuels for Steam Generation. W. Francis Goodrich. The second and concluding paper deals with the adaptations of the boiler furnace and appliances to the satisfactory combustion of low-grade fuels. 3000 w. Engineering Magazine—Jan., 1905. No. 73793 B.

Burning Low-Grade Fuel. James F. Hobart. Considers boiler firing with coal containing a large percentage of ash, slate and other incombustible matter. 3000 w. Elec Wld—July 7, 1906. No. 77870.

Crude Oil Burning at Eagle Mills, Newton, Mass. Percy H. Wayne. Describes briefly the mills and their equipment, and the Hammel device used for oil burning. Ills. 1400 w. Engr, U S A—July 16, 1906. No. 77994 C.

Liquid Fuel for Steam-Raising. A review of the recent report of the United States Naval Board on the series of tests carried out to determine the relative value of coal and liquid fuel for naval purposes. Considers only the liquid fuel results. Ills. 4000 w. Engng—July 20, 1906. No. 78306 A.

Liquid versus Coal Fuel. W. N. Best. A comparison, favoring liquid fuel. Ills. 1700 w. Sci Am Sup—July 7, 1906. No. 77828.

## STEAM ENGINEERING

## Fuel

Notes on Fuel Combustion in Power Plants. F. H. Corson. The first of a series of articles discussing the means of securing efficiency. 1600 w. Elec Engr, Lond—Aug. 10, 1906. Serial. 1st part. No. 78667 A.

Fuels and Combustion. Sanford A. Moss. A condensed outline of the fundamental principles underlying the general subject of solid, liquid and gaseous fuels and their combustion. 4000 w. Power—Oct., 1906. Serial. 1st part. No. 79464 C.

Fuel, Water and Gas Analysis for Steam Users. John B. C. Kershaw. The present number considers natural and artificial fuels; their origin, composition and methods of sampling. 2800 w. Elec Rev, N Y—Sept. 8, 1906. Serial. 1st part. No. 79053.

How Should Steam Coal Be Purchased? William M. Booth. Gives replies from prominent engineers, superintendents, purchasers, etc., in regard to methods of buying coal, and discusses the subject generally. 3500 w. Eng Rec—Sept. 22, 1906. No. 79430.

Notes on the Burning of Small Anthracite Coal. E. H. Peabody. Discusses special features of the problem of successful firing with buckwheat coals. 1800 w. Elec Wld—Sept. 1, 1906. No. 78983.

Regulation of the Duration of Combustion. Byron Eldred. On flame regulation and its application to several arts. 3300 w. Jour Fr Inst—Sept., 1906. No. 79262 D.

The Burning of Cheap Fuels. Discusses the need of cheaper production of electrical energy, considering especially boiler-room economy. The present article deals with the burning of anthracite coals known as buckwheats. 2200 w. Elec Wld—Sept. 1, 1906. Serial. 1st part. No. 78982.

Fuel Analysis for Steam Users. John B. C. Kershaw. Considers the sampling and the preparing of the sample, the analysis, etc., illustrating apparatus used. 4800 w. Engr, Lond—Sept. 28, 1906. Serial. 1st part. No. 79711 A.

Gaseous Fuels. Oskar Nagel. Translated from Baron Hanns Jüptner von Jonstorff's Chemical Technology of Energies. Considers the methods of production of gaseous fuels, their composition, etc. 4000 w. Elec Chem & Met Ind—Oct., 1906. No. 79658 C.

Some Characteristics of Coal as Affecting Performance with Steam Boilers. W. L. Abbott. Gives results and conclusions from the report of Mr. Bement in regard to tests made by the Chicago Edison Company. General discussion.

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## Fuel Oil

15500 w. Jour W Soc of Engrs—Oct., 1906. No. 80006 D.

The Burning of Washer Slate and Coke Braize. C. G. Atwater. Reports the writer's experience with this low-grade fuel. The results were excellent and showed a saving of \$43 per day over coal under former conditions. Ills. 2500 w. Elec Wld—Oct. 6, 1906. No. 79677.

## Fuel Oil.

Burning Fuel Oil. J. E. Anderan. An illustrated description of a fuel oil system for a 300-h. p. plant, built to comply with the insurance rules. 1200 w. Engr, U S A—March 1, 1906. No. 75336 C.

## Fuel Testing.

Coal Testing. John Holliday. Abstract from a paper read before the Dublin Sec. of the Inst. of Elec. Engrs. Discusses briefly the various methods of testing and a number of the instruments devised for making tests, and properties affecting the value of coal. 4500 w. Col Guard—April 13, 1906. No. 76197 A.

## Fuel Value.

The Fuel Value of Some Tennessee and Kentucky Coals. Charles A. Ferris. A description of the Parr Calorimeter and the results obtained in using it. 1400 w. Mines & Min—March, 1906. No. 75452 C.

## Furnace Flues.

Tests on the Elasticity of Furnace Flues with Single Corrugations. (Versuche über die Elastizität von Flammrohren mit einzelnen Wellen). C. Bach. Data and results of tests on the Pommée type of flue, containing two deep corrugations in a length of about a metre. 1200 w. Zeitschr d Ver Deutscher Ing—Dec. 23, 1905. No. 74603 D.

## Gas Firing.

Natural Gas Under Steam Boilers. Jay M. Whitham. Gives the results of the author's investigations. The tests show that the best coal efficiency cannot be obtained with gas. 2500 w. Trans Am Soc of Mech Engrs (No. 078)—Dec., 1905. No. 73444.

## Governors.

The Tolli Spring Governor. Emile Guarini. Illustration with description of the operation of these governors. 800 w. Sci Am Sup—Dec. 2, 1905. No. 73557.

An Automatic Multi-Stage Turbine Governor. Henry F. Schmidt. Explains the three general ways of accomplishing the variation of steam supply in accordance with the load, and gives an illustrated description of a new type of governor and its operation. 1400 w. Power—Jan., 1906. No. 74131 C.

## STEAM ENGINEERING

## Inspection

Governor Springs. H. R. Hall. Gives a chart for determining the dimensions of a spring for a governor, with information in regard to its use, and illustrated by examples. 1800 w. Prac Engr—Dec. 29, 1905. No. 74283 A.

The Williams Governor and Its Design. E. F. Williams. Illustrated description of a governor designed to operate light running, balanced valves at a speed variation of from 2 to 2½ per cent. 2000 w. Engr, U S A—Feb. 1, 1906. No. 74860 C.

The Action of Governors. E. E. Russell. Gives analysis of the action of a governor, and explains the principle of the flyball governor. Ills. 1000 w. Engr, U S A—March 1, 1906. No. 75335 C.

Ruston and Recke's Shaft Governor. Illustrated description of a design of centrifugal shaft governor, recently patented. 1000 w. Mech Engr—May 5, 1906. No. 76659 A.

Electro-Magnetic Control of Governors. Harry R. Speyer. Describes a method of keeping the voltage constant by use of an electro-magnetic coil attached to one end of the lever of the engine governor. Ills. 1000 w. Elec Rev, Lond—Oct. 5, 1906. No. 79794 A.

The Inertia Governor. I. A Study of the Inertia Fly-Wheel Governor. H. A. Swanton. II. Adjusting the Rites Inertia Governor. R. E. Cahill and S. H. Bunnell. Articles from the analytical and operative standpoints. Considers the principles involved and how to apply them. Ills. 4400 w. Power—Nov., 1906. No. 80075 C.

See Electrical Engineering, Generating Stations.

## History.

The First Steam Engines out of England (Die Ersten Dampfmaschinen ausserhalb Englands). Conrad Matschoss. A review of early installations of Newcomen and Savery engines on the Continent, from 1715 to 1763, with illustration of a Newcomen engine built by Potter for the Königsberg coal mine in Hungary, in 1722. 3500 w. Zeitschr d Ver Deutscher Ing—Dec. 9, 1905. No. 73808 D.

## Indicators.

Inertia of the Piston and Pencil Mechanism of the Steam-Engine Indicator. Thomas Hall. An explanation of defects of the indicator and its adjustment. 1500 w. Power—Aug., 1906. No. 78328 C.

## Inspection.

Steam Boiler Inspection. Judson H.

# MECHANICAL ENGINEERING

## Injectors

Boughton. Outlines the methods employed by experts in this work, and the conditions essential to safety in service. 1000 w. Engr, U S A—Aug. 15, 1906. Serial. 1st part. No. 78631 C.

## Injectors.

High Pressure Steam Tests of an Injector. Strickland L. Kneass. Reports a series of tests of the instrument known as the Improved Self-acting Injector, Size No. 10½, showing an unusually efficient injector through a wide range of conditions. Ills. 2200 w. Jour Fr Inst—Oct., 1906. No. 79729 D.

## Losses.

Central Station Boiler-Room Losses. T. R. J. Orr. Calls attention to some sources of waste which can easily be kept in hand, which arise to alarming proportions if neglected. 3500 w. Elec Engr, Lond—May 4, 1906. No. 76660 A.

## Lubrication.

Engine Friction and Lubricants. R. T. Strohm. Discusses the effect of friction, the theory and the action of a lubricant, the selection of lubricants, and their use. 2000 w. Am Elect'n—Nov., 1905. No. 73056.

Steam Engine Lubrication. R. T. Strohm. Illustrates and describes the construction and operation of various lubricators, as applied to the steam engine, with the exception of those used in cylinder lubrication. 3000 w. Am Elect'n—Dec., 1905. No. 73562.

Oil Required for Lubrication. Charles N. Bain. Calls attention to points to be considered in determining the amount of oil used. Ills. 1000 w. Elec Wld—May 5, 1906. No. 76552.

Forced Lubrication in Engines of H. M. S. "Africa." Drawings and description of the forced lubrication system applied to the main propelling machinery of this vessel. 900 w. Engng—July 6, 1906. No. 77983 A.

Oiling Systems for Electric Engines. W. H. Wakeman. Illustrates and describes a number of systems. 1600 w. Elec Wld—July 7, 1906. No. 77869.

Modern Scientific Lubrication. From a paper by H. C. McCarty before the New England R. R. Club. Discusses points of importance in securing satisfactory lubrication, and gives microscopic photographs showing the structure of several bearing metals. 1800 w. R R Gaz—Aug. 10, 1906. No. 78522.

Methods of Internal Lubrication. Robert R. Keith. An illustrated article showing how methods of lubrication were improved to keep pace with engine

## STEAM ENGINEERING

## Packing

development. 2500 w. Engr, U S A—Oct. 15, 1906. No. 79808 C.

## Lubricator.

The Gravity Light-Feed Lubricator. Paul D. Phillips. Explains the working of a gravity lubricator, and the care needed. Ills. 1000 w. Power—July, 1906. No. 77520 C.

## Mains.

Determining the Size of Live Steam Mains. N. A. Cable. Gives two charts and examples illustrating their use. 1400 w. Power—Aug., 1906. No. 78326 C.

## Marine Engines.

See Marine and Naval Engineering.

## Mechanical Draught.

The Conditions of Mechanical Draught Production. Walter B. Snow. Discusses the economy, methods of application, losses, efficiency, &c. 3800 w. Cassier's Mag—March, 1906. No. 75610 B.

## Modern Plant.

An Efficient Modern Steam Plant in Flour-Mill Service. William H. Bryan. Reports an investigation made to ascertain the efficiency of a new power plant, and to compare with the results of the old plant, &c. Ills. 5500 w. Jour Assn of Engng Socs—Jan., 1906. No. 75098 C.

## New Devices.

Notes from Abroad. E. Guarini. Illustrates and describes a new draft gage, new form of water gage, a leakage indicator, and other devices. 1000 w. Engr, U S A—July 16, 1906. No. 77996 C.

## Nomenclature.

The Advantages of Employing Electrical Engineering Nomenclature in Steam Engineering Calculations. H. M. Hobart. Presents some of the advantages, with tables. 1700 w. Elec Rev, Lond—April 27, 1906. Serial. 1st part. No. 76562 A.

## Oil-Burning.

A Simple Oil-Burning Equipment. Courtenay DeKalb. Illustrated description of the equipment installed at the Exposed Treasure mill, Mojave, Calif. 600 w. Eng & Min Jour—Jan. 13, 1906. No. 74380.

## Oil Fuel.

A Good Way to Burn Oil. E. H. Nott-hoff. Describes the method used with success by the writer. Ills. 1200 w. Engr, U S A—Nov. 15, 1905. No. 73260.

Some Observations on Oil Burners. John J. Smith. An account of experiments with these burners. Ills. 1800 w. Am Mach—Vol. 28. No. 45. No. 73075.

## Packing.

Sulzer's Packing Device for Shafts. Illustrates and describes a device de-



# MECHANICAL ENGINEERING

## Pipe Coverings

signed with a view to relieve the packing of pressure caused by the difference of the pressures existing on both sides of the packing device in steam turbines, centrifugal pumps, etc. 800 w. *Mech Engr*—July 28, 1906. No. 78462 A.

## Pipe Coverings.

Value of Non-Conducting Coverings. William H. Fowler. Discusses the loss of heat which takes place in uncovered steam pipes, and the saving effected by non-conducting coverings. 1800 w. *Mech Engr*—Nov. 25, 1905. No. 73585 A.

Recent Calorimetric Investigations upon Heat Insulating Materials (*Neuere Kalorimetrische Untersuchungen von Wärmeschutz mitteln*). H. Benisch and A. Anderson. Instead of steam the pipes were filled with air heated by electric currents, the rates of transmission through various coverings being determined in calories per square metre of surface. 3000 w. *Zeitschr d Ver Deutscher Ing*—Oct. 13, 1906. No. 79908 D.

## Pipes.

Some Facts About Steam Pipe Lines. Walter E. Dixon. Points of importance in the erection of steam pipe lines; the expansion and contraction, joints, leakage, etc. 1700 w. *Power*—July, 1906. No. 77524 C.

Some High-Pressure Steam Pipe Details. James Acton Miller. An illustrated discussion of wrought pipe, the bends, joints, welds, etc. 2500 w. *Cassier's Mag*—June, 1906. No. 77296 B.

A Dangerous Steam Pipe. W. H. Wakeman. An arrangement for a large and small boiler in a battery for supplying steam to run an engine is shown, and its danger explained. 500 w. *Power*—May, 1906. No. 76363 C.

## Piping.

Piping Plans for the Onondaga County Court-House, Syracuse, New York. Charles L. Hubbard. Illustrates and describes the high-pressure and exhaust piping of the power and heating plant in the new court-house. Some of the features are of exceptional interest. 2200 w. *Power*—Jan., 1906. No. 74125 C.

The Arrangement of High-Pressure Piping (*Ueber Befestigung Lagerung, und Kompensation von Hochdruckrohrleitungen*). Discussing especially the methods of securing high-pressure steam pipes so as to provide for expansion and contraction. 2000 w. *Glückauf*—Sept. 8, 1906. No. 79343 D.

## Pistons.

Steam Engines with Heated Pistons. (*Dampfmaschinen mit geheiztem Kolben*).

## STEAM ENGINEERING

## Smoke

Julius Divis. Describing practical attempts to reduce cylinder condensation by introducing live steam into the interior of the piston of a steam engine. 2000 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—Jan. 13, 1906. No. 74652 D.

## Portable Engines.

The Development of the Wolf Portable Engine (*Die Entwicklung der Lokomobilen von R. Wolf*). Karl Heilman. A review of the growth of the portable and semi-portable engine and boiler, to the production of the modern compound type, using superheated steam and giving maximum efficiency. Serial, Part I. 3500 w. *Zeitschr d Ver Deutscher Ing*—March 3, 1906. No. 75708 D.

## Pressure.

Equalized Pressures. An explanation of the laws governing expansion and compression of gases, with diagrams. 1000 w. *Ry & Loc Engng*—Dec., 1905. No. 73526 C.

## Powdered Coal.

Powdered Coal Firing for Steam Boilers. Geo. C. McFarlane. Illustrates and describes the burning of powdered coal with an air blast, and gives an estimate of comparative costs with hand-firing. 1000 w. *Eng & Min Jour*—May 12, 1906. No. 76607.

## Reversing.

Reversing Shaft Governor Engines. W. H. Wakeman. Information that will enable an engineer, who is not an expert, to reverse such engines. Ills. 2500 w. *Elec Wld*—Aug. 4, 1906. No. 78456.

## Safety Devices.

Automatic Safety Devices for Steam Engines, Turbines, and Motors. Charles M. Heminway. On the value and uses of these devices, especially considering engine stops. Ills. 1800 w. *Pro Am Inst of Elec Engrs*—July, 1906. No. 78360 D.

## Slide Valves.

The Application of Calculating Charts to Slide-Valve Design. William J. Goudie. Gives calculating charts designed by the author, explaining their use. 4500 w. *Trans Inst of Engrs & Shipbuilders in Scotland*—Dec. 19, 1905. No. 75209 D.

## Smoke.

Conference of Smoke Abatement. Explains the objects and work of the Coal Smoke Abatement Society, and reviews the work of the conference held at Westminster. 7000 w. *Engr, Lond*—Dec. 15, 1905. No. 74056 A.

Presidential Address at the Conference on Smoke Abatement. Sir Oliver Lodge. Urging the conversion of coal into gas,

# MECHANICAL ENGINEERING

## Smoke

and the piping to towns, not allowing the crude combustion of coal. 3400 w. Jour Roy San Inst—Feb., 1906. No. 75088 D.

Smoke Abatement. John B. C. Kershaw. A report on the London smoke abatement conference 3800 w. Cassier's Mag—Feb., 1906. No. 74921 B.

Smoke Prevention in the Modern Power Station. John B. C. Kershaw. Discusses means of improving the efficiency of the boiler plants. 2500 w. Power—March, 1906. No. 75382 C.

The Prevention of Smoke. Albert A. Cary. Condensed from an address before the N. Y. Sec. of the Soc. of Chem. Ind. Gives suggestions for preventing smoke, discussing the required intelligence in the boiler room, the design of grate, and the design of the furnace. 4000 w. Eng Rec—April 21, 1906. No. 76329.

The Economy of Smoke Abatement. A. S. Atkinson. Discusses methods of securing perfect combustion of fuel. 2000 w. Boiler Maker—May, 1906. No. 76599.

Electricity and Gas V. Smoke. C. Alfred Smith. Principally a review of A. J. Martin's lecture before the Society of Arts. 1800 w. Elec Rev, Lond—May 25, 1906. No. 77127 A.

Smokeless Fuel for Cities. C. G. Atwater. Discusses the relation of the by-product coke-oven process as a method of treating coal for use in cities. Ills. 3500 w. Cassier's Mag—Aug., 1906. No. 78570 B.

The Problem of Smoke Abatement. William H. Bryan. Lecture before the students of Purdue University. Reviews the advance that has been made in smokeless fuels, special apparatus, and processes, giving methods of firing. 3300 w. Sci Am Sup—Aug. 11, 1906. No. 78541.

The Smoke Problem in Large Cities (La Fumée dans les Grandes Villes). E. Maleire. An examination of the various plans for the abatement of the smoke nuisance, as discussed and applied in England and on the Continent. 2500 w. Génie Civil—July 21, 1906. No. 78719 D.

## Spiral Gears.

The Spiral-Gear Problem Simplified. John Edgar. Gives practical rules, with examples showing their application. 1200 w. Am Mach—Vol. 29. No. 29. No. 78054.

## Staybolts.

Concerning Staybolts. A discussion of the design and material of staybolts, quoting from various investigators, and

## STEAM ENGINEERING

## Steam Heating

giving tables of valuable data. 4500 w. Locomotive—April, 1906. No. 77426.

## Steam.

The Thermal Properties of Saturated and Superheated Steam Between 100 and 180 Degrees (Die Thermischen Eigenschaften des Gesättigten und des Ueberhitzten Wasserdampfes zwischen 100 und 180 C.). O. Knoblauch, R. Linde and H. Klebe. An account of researches repeating the work of Regnault, at the Technical High School at Munich. Two articles. 10000 w. Zeitschr d Ver Deutscher Ing—Oct. 21, 28, 1905. No. 73300 each D.

## Steam Accumulator.

The Rateau System for the Utilization of Exhaust Steam from Engines of Intermittent Action (Das Rateausche Verfahren Zur Verwertung des Abdampfes von Maschinen mit unterbrochenem Betrieb). A. Heller. An account of the application of the Rateau accumulator and low-pressure steam turbine to the utilization of exhaust steam. 2500 w. Zeitschr d Ver Deutscher Ing—March 10, 1906. No. 75709 D.

## Steam Consumption.

The Steam Consumption of Piston Engines. T. Stevens and H. M. Hobart. Gives a table of the steam consumption of 33 piston-engines, with report of tests made. 1000 w. Power—Dec., 1905. No. 73704 C.

Steam Consumption of Winding Engines. Reports a trial of an isolated hoisting plant at the Ferriera mine, South Africa, made to determine whether the winding engine was subject to greater condensation losses than the ordinary continuous running engine, and also to discover what economy was effected by the use of trip valves. 3000 w. Engr, Lond—April 13, 1906. No. 76308 A.

The Steam Consumption of Reciprocating Engines. T. Stevens, and H. M. Hobart. A study of the dependency of the steam consumption on the admission pressure, the effect of the degree of vacuum on the steam consumption and the effect of superheat. 1500 w. Elec Wld—Feb. 17, 1906. No. 75041.

## Steam Flow.

How Elastic Steam Lines Are Polarized. W. H. Booth. Explains the conditions essential to the best efficiency of steam turbines. 1200 w. Elec Rev, Lond—Sept. 7, 1906. No. 79220 A.

See Mechanical Engineering, Measurement.

## Steam Heating.

See Mechanical Engineering, Heating and Cooling.

## Steam Jackets

### Steam Jackets.

Recent Experiments on the Efficiency of Steam Jackets (Der Nutzen des Dampfmantels nach Neueren Versuchen). A. Bantlin. A review of the experiments of Prof. D. S. Capper, forming the report to the Steam Engine Research Committee of the Institution of Civil Engineers. Serial. Part I. 3500 w. Zeitschr d Ver Deutscher Ing—July 7, 1906. No. 78112 D.

### Steam Meter.

A Meter for Measuring the Flow of Steam (Dampfgeschwindigkeitsmesser). Describing the improved Gehre meter for measuring the velocity of steam in a pipe by taking the pressure on both sides of a contracted neck. 1500 w. Glückauf—Dec. 9, 1905. No. 73843 D.

### Steam Pipes.

Steam-Pipe Arrangements. William H. Fowler. A discussion of the leading principles that should govern the design and arrangement of steam-pipe installations. 2000 w. Mech Engr—Nov. 4, 1905. Serial. 1st part. No. 73126 A.

### Steam Production.

Distribution of Steam Production in a Locomotive Boiler. Translated from *La Revue Generale*. Gives calculations showing approximately the part played in the total steam production by the direct heating surface of the firebox, and by the tubes. 3800 w. Ry Age—Jan. 12, 1906. No. 74344.

### Steam Valve.

The Hopkinson-Ferranti Steam Valve. Illustrations, with description, of a radical departure in valve construction. The valve works upon the principle of converting the pressure of the fluid into velocity, and then reconverting the velocity into pressure again by means of a suitably formed nozzle. 1500 w. Engng—June 29, 1906. No. 77894 A.

### Stokers.

Test of Shell Boilers Using the Roney Stoker. G. W. Baird. Report of a test made on the boilers of the Post-Office Department at Washington, D. C., to determine whether pea coal would furnish sufficient steam, its economic efficiency, and the quantity needed for a yearly supply. 900 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73951 H.

The Shontz Stoker. Illustrates this stoker as applied to stationary boilers. It consists of a hopper into which the coal is fed; a small wheel forces the coal down on to a chain which carries it into the fire box. 900 w. Ry Mas Mach—Jan., 1906. No. 74112.

## STEAM ENGINEERING

## Superheating

### Stoking.

Mechanical Firing (Mechanische Feuerungen). Hr. Nies. Describing mechanical stokers in use in Germany, with especial reference to the production of a minimum amount of smoke. 3000 w. Zeitschr d Ver Deutscher Ing—Feb. 3, 1906. No. 75110 D.

### Superheating.

A Study of a Semi-Portable Compound Engine with Double Superheating (Etude sur un Type de Locomobile Demi-Fixe Compound avec Double Surchauffe). Ch. Dantin. A report of tests on the Wolf compound engine with intermediate superheater. The thermal efficiency was 19.5 per cent. 2000 w. Génie Civil—Oct. 28, 1905. No. 73314 D.

Properties of Superheated Steam. Prof. J. E. Denton. Reviews the results of investigations made by experimenters and the theories advanced and formulas deduced. 4000 w. Stevens Ind—Oct., 1905. No. 73926 D.

Superheated Steam and the Construction of Superheaters as Used in Power Plants. Franz Koester. Illustrations of types of superheaters, with a discussion of the use of superheated steam. 3500 w. St Ry Rev—Dec. 15, 1905. No. 73778 C.

Superheated Steam. Michael Longridge. A lecture at Bradford Tech. School. Gives an explanation of why superheated steam improves the economy of the steam-engine, and the principles on which a superheating plant should be designed. 10000 w. Engng—Feb. 2, 1906. No. 74873 A.

Can Superheated Steam Contain Water? (Beitrag zur Frage: Kann überhitzter Dampf Wasser Enthalten?) Fritz L. Richter. Data and results of experimental investigations, showing that entrained water cannot exist in pipes in which the steam is superheated 30 degrees C. above saturation temperature. 3000 w. Zeitschr d Ver Deutscher Ing—Feb. 24, 1906. No. 75705 D.

Notes on Superheated Steam. J. R. Bibbins. Discusses important things in order to determine the ultimate commercial value of superheat. 2500 w. Elec Jour—March, 1906. No. 75628.

A New Form of Locomotive Superheater. Illustrated description of an application of the Notkine superheater to the locomotive boiler. 600 w. Ry & Engng Rev—June 16, 1906. No. 77354.

Remarkable Efficiencies in Small Engines Using Superheated Steam. R. E. Mathot. Gives results obtained in a test upon a Wolf engine of 40 h. p. working

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## Superheating

with superheated steam. Ills. 1500 w. Power—July, 1906. No. 77518 C.

Superheated Steam. E. H. Foster. Read before the N. A. S. E. Considers types of superheaters, and the use of superheat as an economy with different types of engines. 2000 w. Engr, U S A—Oct. 15, 1906. No. 79810 C.

Superheated Steam in the Power Station. Arthur S. Mann. Relates some of the experiences met in a plant of 1800 boiler horse power, generating steam of 185 pounds pressure and 200 degrees F. superheat. 2000 w. Jour Fr Inst—Oct., 1906. No. 79730 D.

The Influence of Highly Superheated Steam upon Lubrication and the Deformation of the Valve Gear (Influence de la Vapeur à Haute Surchauffe sur le Graissage et la Déformation des Distributeurs). A. Bauermeister. With data concerning the behavior of lubricants at high temperatures, together with a comparison of Corliss, poppet and piston valves for use with superheated steam. 4000 w. Revue de Mécanique—Sept. 30, 1906. No. 79921 E+F.

See Railway Engineering, Motive Power and Equipment.

## Testing.

Economy Test of a Skinner Engine. Reports a test made by Prof. R. C. Carpenter of an engine in the Ellicott Square Building, at Buffalo, N. Y. Ills. 1200 w. Engr, U S A—Aug. 1, 1906. No. 78374 C.

Steam Consumption Test on a Twin Tandem Compound Condensing Winder at No. 1 Shaft, Village Deep, Ltd., on 15th February, 1906. Messrs. E. J. Laschinger, A. M. Robeson and H. C. Behr. Describes efficiency tests for winders of recent construction and gives results. Ills. 9000 w. Jour S. African Assn of Engrs—March, 1906. No. 76428 F.

## Thermodynamics.

Contributions to the Dynamics of Elastic Fluids (Beiträge zur Dynamik der Elastischen Flüssigkeiten). Dr. A. Flieger. An examination of the modifications in the flow of steam and gases from nozzles, due to the elasticity of the fluid. Two articles. 3500 w. Schweiz Bauzeitung—Jan. 20, 27, 1906. No. 75124 each B.

The Second Law of Thermodynamics; Its Basis in Intuition and Common Sense. William S. Franklin. An explanation of what the law implies and its wide application. 3000 w. Elec Rev, N Y—Sept. 8, 1906. No. 79047.

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### Trap.

The Steam Trap. R. T. Strohm. Illustrated descriptions of types of this device, which is designed to remove the water of condensation from any vessel under pressure without allowing the escape of steam. 3000 w. Power—June, 1906. No. 76752 C.

### Turbines.

Design and Construction of Steam Turbines. Frank Foster. The articles are intended to go beyond the popular description of turbines, but not to be so deeply involved in mathematics as to be above the intelligence of the practical engineer. 1800 w. Mech Engr—Oct. 28, 1905. Serial. 1st part. No. 72994 A.

The Economy of Steam Turbines Compared with that of Reciprocating Engines. T. Stevens and H. M. Hobart. A research investigating the operation of the steam turbine under various conditions, and its comparative qualities as related to the reciprocating engine. Also editorial. 2500 w. Elec Wld—Feb. 24, 1906. No. 75267.

The Evolution and Prospects of the Elastic Fluid Turbine. R. M. Neilson. Gives an historical review showing the progress made in utilizing elastic fluids other than air, with suggestions for future improvement. Discussion. 14500 w. Trans Inst of Engrs & Shipbuilders in Scotland—Dec. 19, 1905. No. 75208 D.

The Regulation of Multi-Stage Steam Turbines (Die Regelung Mehrstufige Dampfturbinen). Harry Jansson. Describing a method of speed regulation by cutting out successive stages of the expansion, in steam turbines of the Parsons type. 2500 w. Zeitschr d Ver Deutscher Ing—Feb. 10, 1906. No. 75119 D.

Why the Steam Turbine Is Not More Efficient. R. M. Neilson. Discusses the losses in turbines, and how to reduce them. 1200 w. Power—Feb., 1906. No. 74898 C.

Installation of a Low-Pressure Steam Turbine. An illustrated description of the conditions, and the plan so far as worked out, for the installation of a 500-K. W. low-pressure, direct-current turbine-driven unit in a power house near Scranton, Pa. 800 w. Power—March, 1906. No. 75383 C.

Steam Turbines. W. H. Booth. Remarks on trouble with the blades of steam turbines, due chiefly to the stripping-out of blades under the influence of something deleterious to them, discussing the cause. 1400 w. Elec Rev, Lond—March 2, 1906. No. 75500 A.

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## Turbines

Test on a 1500 K. W. Curtis Turbine. Reports steam consumption tests on a Curtis turbo-alternator set running at the electricity works of the County of London Electric Supply Co. 700 w. Elect'n, Lond—March 2, 1906. No. 75502 A.

The Effect of Admission Pressure on the Economy of Steam Turbines. T. Stevens and H. M. Hobart. An examination of the results of tests on steam-turbines of the Parsons type, giving curves and tables. 3300 w. Engng—March 2, 1906. Serial, 1st part. No. 75510 A.

Notes on the Steam Turbine (Mitteilungen über Dampfturbinen). A. Rateau. Illustrating and describing the development of the Rateau turbine, and of the Rateau multicellular pressure blower. Two articles. 6000 w. Zeitschr d Ver Deutscher Ing—Sept. 15, 22, 1906. No. 79901 each D.

Some Considerations on the Double-Flow Turbine. Remarks on the advantages and characteristics of this type of steam turbine. 1500 w. Elec Rev, Lond—Oct. 12, 1906. No. 80048 A.

Steam Turbines at the Nurnberg Exhibition. Illustrated description of interesting examples shown at the Bavarian Territorial Exhibition. 1000 w. Engr, Lond—Oct. 19, 1906. No. 80146 A.

The Compound-Reaction Steam-Turbine. Begins a study of this type of turbine, its losses, working, etc. Ills. 2200 w. Engng—Oct. 19, 1906. Serial. 1st part. No. 80138 A.

Simple Steam Turbine Engines. John Richards. Read before the Tech. Soc. of the Pacific Coast. Explains types now in use, the main distinction between steam and water turbines, the action, and briefly reviews various engines showing the development. Ills. 4000 w. Am Mach—Vol. 28, No. 45. Serial. 1st part. No. 73077.

The New 1,000 K.W. Turbodynamo at the Courl Mine (Die Neue 1,000 K.W. Turbodynamo der Zeche Courl). F. Schulte. Describing a 1,500 h. p. Zoelly steam turbine, coupled to a Siemens-Schuckert alternator, the current being used in the Courl mine, in the Dortmund district. 2000 w. Glückauf—Nov. 11, 1905. No. 73342 D.

The Regenerator and Interheater System Applied to the Steam Turbine (Wärmerückführung und Zwischenheizung im Dampfturbinenbetriebe). J. Nadrowski and H. Dahlke. Describing the results obtained by the use of the regenerative principle in steam-turbine opera-

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tion. Serial. Part I. 3500 w. Zeitschr d Ver Deutscher Ing—Nov. 11, 1905. No. 73322 D.

A Broader Field for the Steam Turbine. Discusses the uses of the direct-connected continuous current turbine units. 1000 w. Eng News—Nov. 30, 1905. No. 73548.

Dimensions of Steam Turbines for Marine Work. E. M. Speakman. Read before the Inst. of Engrs. & Shipbuilders in Scotland. Discusses the steps necessary to determine the turbine efficiency and propeller efficiency, and the essentials for correct design. 2500 w. Mech Engr—Nov. 25, 1905. Serial. 1st part. No. 73588 A.

Notes on the Design of Reaction Turbines. Henry F. Schmidt. Explains the conditions peculiar to this type, discussing the principles of reaction, and the methods and calculations necessary. 5000 w. Power—Dec., 1905. No. 73709 C.

Pressures at the Various Stages of Multiple-Stage Steam Turbines. A. M. Levin. An explanation of a ready means for the solution of questions of this class. 1000 w. Power—Dec., 1905. No. 73703 C.

Test of a 500-Kilowatt Curtis Steam Turbine at Ottumwa, Iowa. John Wishart. An account of a test made to determine the performance of the turbine plant and to ascertain its satisfactory operation under guaranteed test conditions. 1700 w. Engr, U S A—Dec. 1, 1905. No. 73616 C.

The Allis-Chalmers Steam Turbine. Illustrated description of the turbine outfit recently installed at Utica, N. Y. 1600 w. Ir Age—Dec. 14, 1905. No. 73722.

The Rateau Steam Turbine and Its Applications. M. J. Rey. A monograph of the steam-turbine created by Mr. Rateau; giving also a classification of the different systems of steam-turbines, and some historical facts regarding the invention. Ills. 24500 w. Jour Am Soc of Nav Engrs—Nov., 1905. No. 73947 H.

Interesting Test of a Curtis Steam Turbine. Reports an economy test of a 500 kw Curtis steam turbine installed in the Oshkosh, Wis., Gas Light Co.'s plant. 2000 w. Power—Jan., 1906. No. 74129 C.

Note on Steam-Turbines. Capt. H. Riall Sankey. Gives diagrams illustrating the production of motion energy in steam-turbines of various types, and the conversion of this energy into mechanical work, with explanatory notes. 1400 w. Engng—Jan. 5, 1906. No. 74415 A.

Steam Turbines with Velocity and Pressure Stages (Dampfturbinen mit Geschwindigkeitsstufen und mit Druckst-

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iciency of multiple stage steam turbines fen). Fritz Krull. Comparing the ef- with velocity drop and those with pres- sure drop in the successive stages, as dis- cussed by Prof. Rateau at Liège. 2000 w. Zeitschr d Oesterr Ing u Arch Ver— Dec. 29, 1905. No. 74621 D.

Tests of DeLaval Steam-Turbine. Thomas B. Morley. A report of an in- vestigation carried out under the auspices of the Carnegie Trust. Explains the ob- ject, describing the apparatus and method of conducting trials, giving results. Ills. 2700 w. Engng—Dec. 29, 1905. No. 74298 A.

The Steam Turbine. Henry Y. Haden. Gives a short history of the turbine, and a description of the most prominent types in the service in America, with remarks on durabilities and economies. 2500 w. Jour of Elec—Jan., 1906. No. 74308 C.

Turbine Machinery. S. A. Everett. Ab- stract of a paper read before the S. Wales Inst. of Engrs. Briefly reviews the his- tory of the turbine and describes the De- Laval turbine in the present number. Ills. 2300 w. Min Jour—Dec. 23, 1905. Serial. 1st part. No. 74147 A.

Launch of the First American Built Turbine Steamship. An illustrated ac- count of the launch of the "Governor Cobb," at Chester, with information concerning other turbines building. 1800 w. Naut Gaz—April 26, 1906. No. 76388.

Progress Made in the Application of the Parsons Turbine to Marine Propul- sion. R. J. Walker. Briefly outlines the development of the turbine as an en- gine now used extensively for generating electricity and other uses, especially dis- cussing its application to marine propul- sion. 5500 w. Marine Rev—April 26, 1906. No. 76387.

Tests of a Curtis Marine Turbine. W. G. Diman. Describes the turbine and reports tests made in Brooklyn, N. Y. to determine the amount of steam used per brake horsepower at different revolu- tions per minute, and with steam varying in quality from saturated to about 50° F., superheat. 3000 w. Tables and diag- rams. Jour Am Soc of Nav Engrs— Feb., 1906. No. 76351 H.

The Application of Steam Turbines to the Propulsion of Vessels (L'Application des Turbines à Vapeur à la Propulsion des Navires). G. Hart. A very com- plete review of the applications of tur- bines of various types to steamships with tabulated details of 22 turbine-propelled boats of all classes. 15000 w. 2 plates. Mem Soc Ing Civ de France—Jan. 1906. No. 76234 G.

The History and Development of the Steam Turbine. Harry Y. Haden. The present number reviews the history of the steam turbine from its first concep- tion. Later article will describe the var- ious types in service at present. Ills. 1700 w. Jour of Elec—April, 1906. Ser- ial. 1st part. No. 75999 C.

The Utilization of Exhaust Steam in the Low-Pressure Turbine in Mining Plants (Verwertung des Abdampfes in Niederdruck-Turbinen-Anlagen auf Bergwerken). H. Hundt. Illustrated description of various installations of the Rateau steam accumulator for regulat- ing the flow of exhaust steam for use with a low pressure steam turbine. 4000 w. Glückauf—March 17, 1906. No. 76238 D.

Brake Tests of a 500-Kw. Westing- house-Parsons Turbine. An account of some runs made at Atlanta, at the works of the Westinghouse Machine Co., with curve sheet. 1200 w. Eng Rec—May 19, 1906. No. 76737.

Condensing Machinery for Steam Tur- bines. Illustrated description of two types of sub-base condensers designed specially for working in conjunction with steam turbines of the Curtis type. 700 w. Engng—April 20, 1906. No. 76453 A.

Some Practical Experiences with Steam Turbines. C. E. Stanton. Read before the Iowa Elec. Assn. Describes things learned in the practical operation of steam turbines. 2500 w. St Ry Jour —April 28, 1906. No. 76411 C.

Steam Turbines for Variable Loads. Illustrated description of a steam tur- bine patented by W. J. A. Loudon, de- signed to run efficiently at light loads. 1200 w. Mech Engr—April 21, 1906. No. 76442 A.

Some Practical Experiences with Steam Turbines. C. E. Stanton. Read before the Iowa Elec. Assn. Considers step- bearing pumps, bafflers, strainers, valves, nozzles, lubrication, etc. 2800 w. Sci Am Sup—June 2, 1906. No. 77045.

The Present Status of the Steam Tur- bine. Reviews a report presented at the recent meeting of the National Electric Light Assn., giving results of investiga- tions during the past year into the de- velopment of steam turbines and their maintenance. 5400 w. Eng Rec—June 16, 1906. No. 77338.

Comparison between Pressure and Im- pulse Turbines (Vergleich der Druck und Ueberdruck-Dampfturbinen). Do- nat Banki. A mathematical computation showing that the loss of energy in the pressure turbine is 1.4 times that in the

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impulse turbine. 1200 w. Zeitschr d Ver Deutscher Ing—June 16, 1906. No. 78100 D.

Tests of a 500-Kilowatt Steam-Turbine Unit. Illustrated description of the turbine giving results of tests made by Prof. Schröter, of Munich. 1500 w. Engng—July 6, 1906. No. 77982 A.

The Steam Turbine. Charles Algeron Parsons and George Gerald Stoney. Reviews the early history, explaining the general theory and principles, and describing the Parsons, DeLaval and Curtis turbines. Gives results of trials and general discussion. Ills. 21500 w. Inst of Civ Engrs. No. 3548. No. 78018 N.

Steam Turbines. Sydney W. Baynes. Read before the Incor. Munic Assn. (Slightly abridged). Illustrates and describes most of the makes of steam turbines on the market. Discussion. 10700 w. Elect'n, Lond—June 22, 1906. No. 77781 A.

Development and Importance of the Steam Turbine. Prof. Dr. A. Riedler. Abstract translation of a paper read before the Society of German Engrs., Berlin. Gives the writer's opinions concerning the success and economy of steam turbines, and their many advantages. 2000 w. Power—Sept., 1906. No. 78883 C.

Notes on Steam Turbines (Ueber Dampfturbinen). A. Riedler. A general review of the process of utilizing the energy of steam in motors of the turbine type, discussing the design of existing machines. Two articles. 10000 w. Zeitschr d Ver Deutscher Ing—Aug. 4, 11, 1906. No. 78709, each D.

A Chat About Steam Turbines. E. Austin. Considers turbines constructed on the Parsons' principle, dealing, in the present article, with the starting of the turbine for the first time, and the question of governing. 4000 w. Elec Rev, Lond—Sept 14, 1906. Serial. 1st part. No. 79446 A.

Recent Advances in Steam-Turbines, Land and Marine. Gerald Stoney. Read before the British Assn. On the development of the Parsons steam-turbine. Short discussion. 3800 w. Elec Engr, Lond—Aug. 24, 1906. No. 78998 A.

Steam-Turbine for Driving Cotton Machinery. Illustrated description of the plant at the Sladen Wood Mills, near Manchester, England, where a steam-turbine, arranged for rope transmission, is driving a weaving-shed containing 750 looms. 2200 w. Engng—Sept. 7, 1906. No. 79234 A.

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The Construction of Steam Turbines by the General Electric Company, Berlin (Der Dampfturbinenbau der Allgemeinen Elektrizitäts-Gesellschaft, Berlin). O. Lasche. A very fully illustrated description of the shops of the A. E. G., showing the detailed operations of building the Curtis turbine in Germany. Two articles. 10000 w. Zeitschr d Ver Deutscher Ing—Aug. 18, 25, 1906. No. 79304 each D.

The Use of Interheaters in Steam Turbine Plants of Various Sizes (Der Nutzen der Zwischenheizung bei Turbinenanlagen verschiedener Grösse). J. Nadrowski. With tables showing the economy effected in a number of actual installations using the Knorring-Nadrowski system of interheaters and reheaters. 4000 w. Zeitschr f d Gesamte Turbinenwesen—Aug. 20, 1906. No. 79303 D.

See also Electrical Engineering, Generating Stations.

See Also Marine and Naval Engineering.

## Valve Gears.

A New Valve Gear Embodying a Novel Mechanical Movement. Illustrates and describes an interesting valve gear recently designed by E. J. Armstrong, of the Ball Engine Co., Erie, Pa. 1400 w. Mach, N Y—Nov., 1905. No. 72939 C.

Correcting a Faulty Valve Gear. H. A. Davis. Describes method and shows results. 800 w. Engr, U S A—Nov. 1, 1905. No. 72952 C.

Marshall's Valve Gear. Illustrated detailed description of a successful valve gear, the invention of James T. Marshall. 2000 w. Engr, Lond—Nov. 3, 1905. No. 73137 A.

Musgrave's Valve Gear for Steam Engines. Illustrates and describes an improved construction and arrangement for steam engines of the type in which the distribution is effected by four separate balanced piston valves, two for admission and two for exhaust. 900 w. Mech Engr—Nov. 25, 1905. No. 73590 A.

Strength and Resistance Conditions in Marine Valve Gears (Kraft und Festigkeits-Verhältnisse bei Schiffsmaschinen Steuerungen). Arthur Pröll. An examination of the link motion and of various radial valve gears, showing the frictional and inertia resistances, and the consequent proportions of the various members. Serial. Part 1. 3000 w. Schiffbau—April 11, 1906. No. 76262 D.

## Valves.

The Globe Valve—Its Origin and De-

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### Valve Setting

velopment. J. O'Meara. An illustrated account of the origin and development of this steam valve. 1000 w. *Heat & Vent Mag*—Nov., 1905. No. 73264.

Various Applications of Balanced Cylindrical Slide Valves (*Verschiedene Verwendungen des Entlasteten Rohrschieber-ventiles*). F. Strnad. With illustrations of a variety of steam valves using tubular piston devices to relieve the steam pressure. 3000 w. *Zeitschr. d. Ver. Deutscher Ing*—Nov. 4, 1905. No. 73308 D.

Development of Valves and Valve Motion. Angus Sinclair. An illustrated article reviewing the history of steam engine valves and describing types. 4000 w. *Ry & Loc Engng*—March, 1906. Serial. Part I. No. 75487 C.

### Valve Setting.

Setting the Valves of the Fleming Piston Valve Engines. Thomas Hall. Illustrated description of method. 2000 w. *Power*—June, 1906. No. 76747 C.

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### Aeronautics

Setting Valves of the Rice-Sargent Engine. W. E. Crane. Directions for setting the Corliss valves on these engines. Ills. 1600 w. *Power*—Sept., 1906. No. 78876 C.

Setting the Valves on Double-Eccentric Corliss Engines. E. H. Lane. Gives suggestions for the setting of the valves of various engines. 1500 w. *Power*—Sept., 1906. No. 78882 C.

Setting the Valves of the Fleming Four-Valve Engine. Thomas Hall. Directions, with illustrations, tables, etc. 2500 w. *Power*—Oct., 1906. No. 79458 C.

### Water Softening.

Notes on Water Softening. W. M. effect of neutral salts, the influence of the apparatus used, the determination of lime factor, and the soda factor, &c. 1700 w. *Eng & Min Jour*—Dec. 2, 1905. No. 73538.

## MISCELLANY

### Aeronautics.

Recent Experiments in Aerial Navigation (*Un Nouvel Essai de Navigation Aérienne*). M. Léger. An illustrated description of the experiments with lifting screw-propellers, made by the author for the Prince of Monaco. 4000 w. *Rev Gen des Sciences*—Nov. 15, 1905. No. 73875 D.

Recent Experiments with the Lebaudy Balloon (*Les Nouvelles Expériences du Lebaudy*). Lt. Col. G. Espitallier. An illustrated account of the ascensions of the dirigible balloon of Lebaudy in 1904-1905, including the trip of 210 kilometres from Moisson to Mourmelon. 2000 w. *Génie Civil*—Dec. 9, 1905. No. 73815 D.

The Useful Coefficient of Screw Propellers (*Sur le Coefficient d'Utilisation des Hélicoptères*). Edgar Taffureau. An examination of the best proportions of lifting screw propellers for use for aeronautical purposes, following the work of the late Col. Renard. 1200 w. *Comptes Rendus*—Nov. 27, 1905. No. 73830 D.

The Aero Club of America's Exhibit of Aeronautical Apparatus. Illustrates and describes some of the interesting exhibits recently shown in connection with the Sixth Annual Automobile Show, in New York City. 1400 w. *Sci Am*—Jan. 27, 1906. No. 74572.

The Stability of Aeroplanes and the Rational Construction of Sustaining Planes (*Sur la Stabilité des Aéroplanes et la Construction Rationnelle des Plans Sustenbateurs*). Edmond Seux. An examina-

tion of the problem of longitudinal stability, with especial reference to the early work of Penaud. 1500 w. *Comptes Rendus*—Jan. 8, 1906. No. 74640 D.

The "White Flyer"—The Motor Driven Aeroplane of the Brothers Wright. States what the Wright Brothers have accomplished, the means by which they have effected it, etc. Ills. 3000 w. *Auto Jour*—Jan. 6, 1906. No. 74395 A.

Count von Zeppelin's Dirigible Airship. Reviews the experiments with this airship, and gives an illustrated description of improvements recently introduced. 1300 w. *Sci Am*—March 3, 1906. No. 75321.

Some Recent Foreign Flying Machines. Illustrates and describes some of the latest attempts at solving the problem of flight. 1700 w. *Sci Am*—March, 1906. No. 75636.

How to Make a Gliding Machine. Livingston Wright and Gordon Johnson. Directions with working drawings. 1000 w. *Sci Am Sup*—April 28, 1906. No. 76384.

The Perfecting of the Aeroplane Flying Machine. Livingston Wright. Discusses the system of control worked out by the Wright brothers, and briefly reviews the work of other investigators. 1400 w. *Sci Am Sup*—April 7, 1906. No. 75932.

The Wright Aeroplane and Its Performances. An illustrated article on the



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success of the Wright brothers with their gliding machine in its improved form, with reports from eye-witnesses of the performance. 2000 w. *Sci Am*—April 7, 1906. No. 75927.

The Wright Brothers Flying Machine and What It Has Accomplished. A communication from Messrs. Orville and Wilbur Wright, to the Aero Club of America, giving details of the development of their motor-driven aeroplane. Also a letter to the Aeronautical Society of Gt. Britain and a short account of Santos Dumont's helicoptere. 2200 w. *Sci Am Sup*—April 7, 1906. No. 75931.

The Flying and Soaring of Birds Explained by Well-Known Mechanical Principles. H. LaV. Twining. Presents results of experiments and observations, explaining the fundamental principles. Diagrams. 5000 w. *Sci Am Sup*—May 5, 1906. No. 76504.

The Wellman Expedition to the Pole in a Dirigible Balloon (Au Pole Nord en Ballon Dirigeable. L'Expedition Wellman). Lt. Col. G. Espitallier. A description of the balloon, automobile sledge, and apparatus, with an abstract of the computations of sustaining power and resistance. 4000 w. *Génie Civil*—Aug. 18, 1906. No. 79316 D.

A Proposed Solution of the Problem of Flight. Franz Pabisch. Translated from *Stein der Weisen*. Illustrated discussion of several flying machines, and their ability to satisfy necessary conditions. 1000 w. *Sci Am Sup*—Feb. 10, 1906. No. 74956.

The Alighting of Aeroplanes (Sur l'Atterrissage des Aeroplanes). M. Bouquet de la Grye. Describing the application of a horizontal plane above the supporting surfaces, to enable the machine to maintain its equilibrium during the descent. 800 w. *Comptes Rendus*—Jan. 15, 1906. No. 75115 D.

The Helicoptere: Santos-Dumont's Latest Flying Machine. L. Ramakers. Illustrated description of a machine in course of construction. 1300 w. *Sci Am*—Feb. 10, 1906. No. 74951.

Results of the First International Balloon Race. An interesting account of the Aeronautic Cup contest for spherical balloons. 1500 w. *Sci Am*—Oct. 13, 1906. No. 79753.

The First International Balloon Race. An illustrated account of the race for the cup offered by James Gordon Bennett. 1600 w. *Sci Am*—Oct. 27, 1906. No. 80093.

## Agriculture.

Clearing New Land. Franklin Wil-

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liams, Jr. Illustrates and describes methods of pulling stumps by mechanical means in the present number. 4800 w. *Sci Am Sup*—Sept. 15, 1906. Serial. 1st part. No. 79177.

## Air Resistance.

Experiments to Determine the Relation Between Air Resistance and the Form of a Moving Body (Versuche zur Ermittlung der Abhängigkeit des Luftwiderstandes von der Gestalt der Körper). Albert Frank. Data and results of experiments upon prismatic and conical bodies, showing the reduced resistance for the latter forms. 4000 w. *Zeitschr d Ver Deutscher Ing*—April 21, 1906. No. 76800 D.

## Air Pressure.

Variation in Atmospheric Pressure with Altitude. D. W. Hering. Explains how to determine the variation in atmospheric pressure with varying elevation, the changes of temperature with elevation, and the effect on the efficiency of compressors. 2000 w. *Compressed Air*—Sept., 1906. No. 79257.

## Analysis.

A Graphic Method of Harmonic Analysis. J. Harrison. Describes a graphical process for the harmonic analysis of cyclical functions, explaining the method. Diagrams. 1200 w. *Engng*—Feb. 16, 1906. No. 75282 A.

## Card Index.

The Application of Card Index Systems to a Motive Power Office. J. H. Wynne. Gives sample cards used, explaining their convenience. 1200 w. *Ry Mas Mech*—Feb., 1906. No. 74826.

## Congress.

The International Congress of Applied Mechanics at Liège (Congrès International de Mécanique Appliquée, Tenu à Liège). Aime Witz. A general review of the discussions at the Mechanical congress at the Liège exposition. Two articles, 6000 w. *Génie Civil*—Dec. 16, 23, 1905. No. 74623 each D.

## Damascening.

Damascening and the Inlaying and Blending of Metals. Sherard Cowper-Coles. An introductory historical sketch of this art, describing the processes used in ancient times, and also of a new process and its results. Discussion. Ills. 5400 w. *Jour Soc of Arts*—June 1, 1906. No. 77182 A.

## Drying.

The Art of Drying. George Wetmore Colles. Discusses its application to manufacturing processes, the systems, the

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## Engineers' Club

types of dryers, etc. 3800 w. Stevens Ind—April, 1906. No. 76099 D.

## Engineers' Club.

Electrical and Mechanical Equipment of the New Engineers' Club Building, New York. Describes the general plan of this fine building in New York City, and the details of its electrical and mechanical equipment. Ills. 3000 w. Elec Wld—May 19, 1906. No. 76741.

## Engineering Building.

The Engineering Building. Illustrated description of the principal features of the fine building being erected in New York City, taken from a recently issued report. 1800 w. Ir Age—Dec. 14, 1905. No. 73719.

## Exhibition.

The Engineering and Machinery Exhibition, Olympia. Joseph Horner. Illustrates and describes some of the interesting exhibits. 4500 w. Engng—Sept. 21, 1906. Serial. 1st part. No. 79587 A.

## History.

The Changes of One Lifetime in the Machine Shop. Egbert P. Watson. An account of the experience of the author in connection with the advance in materials, shop methods, and machine tools during the past fifty years. 3500 w. Engineering Magazine—March, 1906. No. 75167 B.

## Invention.

Discovery and Invention. Edward Goodrich Acheson. A lecture before the students of Sibley College. Briefly notes examples of discovery without invention, invention without discovery, and discovery with invention, and gives an interesting review of the writer's personal work. 4500 w. Sib Jour of Engng—May, 1906. No. 77028 C.

## Inventing.

The Art of Inventing. Edwin J. Prindle. Remarks on this subject, with an illustrated description of how the cord knoter of the self-binding harvester was invented. 2200 w. Sci Am—June 23, 1906. No. 77419.

## Laundry Machinery.

The Technology of Laundry Machinery (Die Technischen Hilfsmittel der Mechanischen Wäschereinigung). G. Rohn. With numerous illustrations of machines for the various laundry operations, and a bibliography of works upon the subject. Two articles. 5000 w. Zeitschr d Ver Deutscher Ing—Feb. 3, 10, 1906. No. 75108 each D.

## Liquid Air.

The Liquefaction of Air (Liquéfaction de l'Air). Discussing especially the pro-

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duction of pure oxygen by fractional distillation of liquid air. 2500 w. Génie Civil—Dec. 9, 1905. No. 73817 D.

The Liquid Air Plant of the Chemistry Department, University of California. F. G. Cottrell. Illustrates and describes the plant and its operation, and the uses made of it. 4000 w. Cal Jour of Tech—Sept., 1905. No. 74077 C.

The Separation of Oxygen and Nitrogen by the Partial Liquefaction of Air (Sur l'Application de la Liquéfaction Partielle de l'Air avec Retour en Arrière a la Separation Intégrale de l'Air en Oxygene Pur el Azote Pur). Georges Claude. Describing the operation of a regenerative apparatus for the fractional separation of oxygen. 1200 w. Comptes Rendus—Nov. 20, 1905. No. 73828 D.

Liquid Air and Charcoal at Low Temperature. An account of an experimental discourse demonstrating some novel features of studies on liquid air and the application of charcoal at low temperatures. 2500 w. Engng—June 15, 1906. No. 77488 A.

A Novel Process of Liquefying Air and Separating Oxygen. Dr. Alfred Gradenwitz. Illustrates and describes the Claude Liquid Air Apparatus, and discusses some of the industrial possibilities. 1200 w. Prac Engr—Aug. 24, 1906. No. 78991 A.

## Mechanical Plant.

The Mechanical Plant of the Hotel Belmont, New York City. Briefly outlines the interesting features of this structure on the corner of 42nd St. and Park Ave. and describes the extensive plant that has been installed. Ills. 4800 w. Eng Rec—Dec. 30, 1905. Serial. 1st part. No. 74137.

## Mechanics.

On Equipomental Systems and Their Use in Applied Mechanics. R. F. Muirhead. Gives some simple systems of points which are equipomental with the most commonly occurring types of bodies and areas, pointing out some advantages of their use in practical calculations. Discussion. 4800 w. Trans of Inst of Engrs & Shipbldrs—May 1, 1906. No. 79758 D.

## Oxygen.

The Production of Oxygen and Nitrogen from Liquid Air (Ueber die Herstellung von Sauerstoff und Stickstoff aus Verflüssigter Luft). F. Linde. A review of the progress which has been made in the fractional distillation and rectification of liquid air; discussing also the practical uses of the oxygen and nitrogen thus obtained. 2500 w. Zeitschr

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d Ver Deutscher Ing—April 28, 1906. No. 76803 D.

The Use of Liquid Air in the Manufacture of Oxygen and Nitrogen (*La Liquéfaction de l'Air et ses Applications à la Fabrication Industrielle de l'Oxygène et de l'Azote*). Georges Claude. A detailed account of the commercial production of oxygen as now actually conducted in France, by the rectification of liquid air. 7000 w. *Mem Soc Ing Civ de France*—Nov., 1905. No. 75729 G.

### Oxygen Flasks.

The Explosion of Oxygen Flasks (*Ueber Sauerstoffflaschen - Explosionen*). R. Nowichi. An account of the bursting of cylinders of compressed oxygen, showing such occurrences to be due to the presence of hydrocarbons, or to defective valve construction. 1800 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—Jan. 20, 1906. No. 75134 D.

### Photography.

Technical Photography. Frederick Henius. Discusses the photographing of machinery and interiors; the outfit needed, and factors of importance. Ills. 4000 w. *Pro Engrs Soc of W. Penn*—May 1, 1906. No. 76906 D.

### Progress.

Progress in Iron and in Mechanical Art. J. H. Wicksteel. Lecture at Leeds before the Assn. of Yorkshire Students. Discusses some improvements now in progress, and of recent date in the present number. 5000 w. *Engr, Lond*—Dec. 8, 1905. Serial. 1st part. No. 73913 A.

### COAL AND COKE

#### Review.

Mechanical Engineering. An editorial review of the year 1905, considering railways; marine, stationary and gas engines; suction gas producers; gas turbines, motor cars, and machine tools. 5000 w. *Engr., Lond*—Jan. 5, 1906. No. 74426 A.

#### Solar Heat.

The Utilization of Solar Heat for Industrial Purposes by Means of a New Plane Mirror Reflector. Carl Güntner. Illustrates and describes a new method of reflector construction, by the use of plane mirrors, discussing the application to practical uses. 6800 w. *Sci Am Sup* May 26, 1906. No. 76789.

#### Theater Plant.

Power Plant of the Majestic Theater Building. Illustrated detailed description of a plant that supplies light, heat and power to a 20-story office building and a 9-story theater in Chicago. 4000 w. *Engr, U S A*—May 15, 1906. No. 76743 C.

#### Tinning.

Tinning. Translated from the German of Friedrich Hartmann's "Das Verzinnen, Verzinken, Vernickeln, etc." Discusses the process, the testing of tin, alloys used as substitutes, etc. 1800 w. *Sci Am Sup*—June 23, 1906. No. 77421.

#### Wind Shield.

A Novel Wind Shield. Joseph Eyséric. Translated from *La Science au XXme Siècle*. Illustrated description of a shield useful on bridge of a ship, in railway signal towers, on locomotives, and on automobiles. 1000 w. *Sci Am Sup*—Sept. 29, 1906. No. 79506.

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#### Accidents.

Falls of Roof and Coal. Gives the recommendations issued by the Prussian Commission, with a view to preventing accidents. 900 w. *Col Guard*—May 25, 1906. No. 77136 A.

#### Africa.

The Geology of the Komati Poort Coal-Field. H. Kynaston. Abstract from the *Trans. Geol. Surv. Repts*. Description with report of full tests. 2000 w. *Min Jour*—June 16, 1906. No. 77472 A.

#### Alaska.

The Matanuska Coal Field, Alaska. William Griffith. Maps and description of an extensive area underlaid by coal of

good quality. 4200 w. *Mines & Min*—May, 1906. No. 76508 C.

#### Anthracite.

Colorado Anthracite. Prof. Arthur Lakes. An illustrated article describing the fields of the state and the influence of eruptive rocks in metamorphosing the bituminous deposits. 2000 w. *Mines & Min*—Jan, 1906. No. 74249 C.

Virginia Anthracite Field. J. E. Tiffany. Describes a region showing coal formations, the values of which have not yet been thoroughly proved by prospecting. 3500 w. *Mines & Min*—March, 1906. No. 75455 C.

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## Beehive Ovens

Anthracite Coal Mining in Colorado. R. M. Hosea. An illustrated article describing the mines in operation, and showing why anthracite coal costs more than soft coal. 2000 w. Eng & Min Jour—Sept. 1, 1906. No. 78940.

## Beehive Ovens.

Beehive Oven Construction. Howard N. Eavenson. Plans and details showing modern practice in the Connellsville and Pocahontas regions. 3000 w. Mines & Min—Sept., 1906. No. 78917 C.

## Bituminous.

Mine No. 2, St. Louis & O'Fallon Coal Co. Illustrated description of the equipment of a new bituminous coal mine of large capacity, near Belleville, Illinois. 2500 w. Mines & Min—June, 1906. No. 77183 C.

Great Lakes Coal Company. John Leggett Pultz. Illustrates and describes mines at Kaylor, near Pittsburg, which are large producers of bituminous coal. 1300 w. Eng & Min Jour—April 7, 1906. No. 75994.

## Boring.

Boring for Coal with a Diamond Drill in British Columbia. R. C. Campbell-Johnston. A letter giving experience and troubles encountered in trying to bring up a perfect core for analysis. Only partial success. 1200 w. Min Jour—July 28, 1906. No. 78472 A.

## Breaker.

A Concrete Breaker. Illustrated description of the application of reinforced concrete construction in building the Pine Hill breaker, near Minersville, Pa. 2500 w. Mines & Min—Jan., 1906. No. 74241 C.

The Truesdale Breaker. Illustrated description of a new breaker and washery, designed to handle an output of four thousand tons per day. 4000 w. Mines & Min—Feb, 1906. No. 74930 C.

## Briquettes.

Some Notes on Fuel Briquetting in America. Clarence M. Barber. Considers the use of briquettes in Europe, their manufacture and the materials used, and the introduction of the industry in America. 3000 w. Jour Assn of Engrg Soc—Jan, 1906. No. 75099 C.

Briquetting of Fuels and Minerals G. J. Mashek. Illustrated description of the Zwoyer Fuel Company's process and the New Jersey Briquetting Company's plant. 1600 w. Ir Age—April 19, 1906. No. 76097.

Some Notes on Fuel Briquetting in America. Clarence M. Barber. Read before the Detroit Engrg. Soc. Considers

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## Classification

the materials used, methods of manufacture, presses, etc. 3000 w. Sci Am Sup—April 7, 1906. No. 75929.

Briquetting of Brown Coal. K. A. Muellenhoff. Gives a description of the briquetting plant of the Lauchhammer Company, a well known iron and steel works in Saxony. The process is quite different from the briquetting of anthracite coal dust and slack coal, as no binder is necessary. Ills. Discussion. 5600 w. Pro Engrs Soc of W Penn—May, 1906. No. 76908 D.

Artificial Fuel. From the German of Dr. Theodor Koller. Mentions some attempts made to prolong the burning of coal, and especially describes in detail the manufacture of briquettes. 3300 w. Sci Am Sup—June 16, 1906. No. 77287.

## British Columbia.

The Northern Interior Plateau Lying Between the Fraser and Skeena Rivers. W. F. Robertson. Extracts from a report giving information of this region, its minerals, principally coal, agricultural possibilities, etc. Ills. 9600 w. B C Min Rec—April, 1906. No. 77190 B.

## California.

California's New Coal Fields. Clarence E. Edwards. Information concerning the bituminous deposits recently discovered and their value. 1700 w. Min Wld—Feb. 17, 1906. No. 75050.

## China.

The Coal Fields of China. L. Ramakers. Information concerning the different fields and their characteristics, costs of mining, transportation, etc. 1700 w. Mines & Min—April, 1906. No. 75970 C.

The Hsüan Hua Coal Fields, China. Noah Fields Drake. Maps and descriptions of three coal beds and the mines. 3500 w. Min Mag—April, 1906. No. 76042 C.

## Classification.

The Classification of Coals. Dr. Persifor Frazer's contribution to the discussion of the paper by Marius R. Campbell. 2700 w. Bul Am Inst of Min Engrs—March, 1906. No. 76121.

Classification of Coals. Marius R. Campbell. Proposes a scheme for accurately defining the classes of coal, which will apply to liquids as well as bituminous coal and anthracite. 2700 w. Min Rept—April 26, 1906. No. 76405..

The Classification of Coals. S. W. Parr. Read before the Am. Chem. Soc. Outlines a plan of classification proposed, discussing its new features. 2000 w. Min Rept—Oct. 18, 1906. No. 80026.

# MINING AND METALLURGY

## Coal

### Coal.

Coal; Its Uneconomic Use and Abuse. John Livingstone. Discusses its uneconomic use and abuse generally, by steam makers, but especially by the railways, and how to save 50 per cent. Also general discussion. 17000 w. Pro St. Louis Ry Club—Oct. 13, 1905. No. 72979.

### Coal-Bed.

The Pittsburg or No. 8 Seam in Ohio. J. L. Pultz. A description of this seam which is considered the most important coal-bed in the state. Also briefly describes some of the principal mines. Ills. 2000 w. Eng & Min Jour—Aug. 25, 1906. No. 78818.

### Coal Cutter.

A New English Coal Cutter. James Tonge. An illustrated description of the "Little Hardy" undercutting and shearing machine, the method of setting and operating. 1800 w. Mines & Min—Jan., 1906. No. 74246 C.

### Coal Cutting.

Tubular Drills for Coal Cutting (Bohr und Schrämmaschine mit Kernbohrwerkzeug). Dr. Tübben. Describing the successful use of core drills for coal cutting in the Friedrichsthal mine at Saarbrück. 1800 w. Glückauf—Feb. 24, 1906. No. 75737 B.

The Introduction of Coal-Cutting Machinery. J. S. Ward. Read before the Nat. Assn. of Col. Engrs. Considers the working of thin seams, the methods of getting coal, the essentials of a good coal-cutting machine, and related matters. Discussion. 5000 w. Ir & Coal Trds Rev—April 27, 1906. No. 76583 A.

### Coalfields.

The West Moreton (Ipswich) Coalfield. Walter E. Cameron. A report of the chief producing coalfield of Queensland, with special reference to the Bundamba district. 4500 w. Queens Gov Min Jour—Sept. 15, 1905. Serial. 1st part. No. 72975 B.

Coal-Field Exploration. Thomas W. Keighley. Read before the Coal Min. Inst. of America. Describes methods of examination and sampling and the equipment needed by a coal expert. 2200 w. Mines & Min—April, 1906. No. 75972 C.

Theory of the Foundation and Occurrence of Coalfields. James Ford. Considers the coalfields were once vast swampy peat-bogs or masses of vegetation forming in standing water, and that the vegetation was mostly of small aquatic species. 3800 w. Ir & Coal Trds Rev—July 13, 1906. No. 78225 A.

## COAL AND COKE

## Coal Tests

The Formation of Coal Fields. William N. Page. A contribution to the discussion of a paper by Marius R. Campbell, concerning the transformation of vegetable matter into the different grades of coal. 1500 w. Min Wld—Aug. 11, 1906. No. 78505.

The Forest of Dean Coalfield. Historical account and description of the British mining field. 2000 w. Ir & Coal Trds Rev—Aug. 24, 1906. No. 79020 A.

### Coal Handling.

Coal Handling in the Chicago Subway. An illustrated description of the arrangements that have been made for the delivery of coal through the freight tunnels. 2300 w. Eng Rec—March 31, 1906. No. 75881.

See Mechanical Engineering, Power and Transmission.

### Coal Measures.

The Occurrence of True Coal Measures at Port Seton. East Lothian. E. B. Bailey, and D. Tait. Abstracted from Trans. of the Edinburgh Geol. Soc. Describes the geology of this region. Map. 2000 w. Col Guard—April 20, 1906. No. 76448 A.

### Coal Resources.

Coal Resources Along the Line of the Moffat Road. Arthur Lakes. Describes the two principal sources of coal along the route of this railway, the character and quality of the coal, and the general geology of the region. 1600 w. Min Wld—Nov. 11, 1905. Serial. 1st part. No. 73116.

### Coal Storage.

Coal-Storage Bunker and Band Conveyor for the Bargold and New Tredegar Collieries. Illustrates and describes the coal-bunker and steel-structural work at the Bargold colliery; and the improved band-conveyor recently installed at the New Tredegar colliery in South Wales. 2000 w. Engng—Jan. 26, 1906. No. 74893 A.

### Coal Supplies.

Coal Conservation, Power, Transmission, and Smoke Prevention. Arthur J. Martin. Considers the probable duration of England's coal supplies, the wastefulness of present methods, possible economics, electrical and gas transmission, etc. General discussion. 14000 w. Jour Soc of Arts—March 30, 1906. No. 75962 A.

### Coal Tests.

The Government Coal Tests. Samuel Sanford. A review of the report of the Coal Testing Operations of U. S. Geological Survey. 3300 w. Eng & Min Jour—April 28, 1906. No. 76401.

# MINING AND METALLURGY

## Coal Testing

### Coal Testing.

Coal Testing Plant Report. Samuel Sanford. A review of the results accomplished by the plant at the St. Louis Exposition. 4300 w. Mines & Min—June, 1906. No. 77188 C.

### Coal Tips.

New Coal Tips at Garston Docks. Illustrates and describes two powerful hydraulic coal tips for the London and North-Western Railway Company, erected near Liverpool. 700 w. Engr. Lond—March 16, 1906. No. 75803 A.

### Coal Trade.

See Industrial Economy.

### Coal Washing.

The Henry Experiments in Coal Washing (Ingenieur Henrys Aufbereitungsversuche mit Kohlen). Julius Divis. Describing the experimental apparatus at the Hasard colliery, Micheroux, Belgium, for determining the best conditions for washing coal of various sizes. Two articles. 6000 w. Oesterr Zeitschr f Berg u Hüttenwesen—June 16, 23, 1906. No. 78149 each D.

### Coke.

Coke as a Blast-Furnace Fuel—Its Manufacture and Characteristic Properties. Edward A. Uehling. An illustrated article explaining the making of coke, the wastefulness of the beehive coke-ovens, and of the early methods used, and the better results obtained by retort ovens. 3000 w. Stevens Ind—Oct., 1905. No. 73928 D.

The Manufacture of Coke in Northern China. Yang Tsang Woo. Brief illustrated description of the coke-kilns and method used. 700 w. Am Inst of Min Engrs—Nov., 1905. No. 73965.

Coke Making in the United States. Edward W. Parker. Reports recent developments in various coking districts to meet present and future requirements. 3500 w. Ir Age—Jan. 4, 1906. No. 74215.

Caking Fine Coal for Coking. Alfred Ernst. Considers the advantages of stamping and compacting at by-product ovens. 3000 w. Ir Age—Feb. 22, 1906. No. 75227.

By-Product Coke Oven Plant at Camden, N. J. C. G. Atwater. Outlines the plan and construction of the original plant at Camden, N. J., and gives an illustrated detailed description of recent additions. 4800 w. Pro Age—April 2, 1906. No. 75866.

By-Product Coke and Huessener By-Product Coke Ovens. J. A. Roelofsen. Read before the British Inst. of Min. Engrs. Illustrates and describes these

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## Coke Oven

ovens stating the advantages claimed. 2500 w. Ir & Coal Trds Rev—June 15, 1906. No. 77494 A.

Domestic Coke Manufacture. F. W. Parsons. Gives a sketch showing the general arrangement of a domestic coke plant capable of producing 50 to 100 tons per day, at comparatively small outlay. 600 w. Eng & Min Jour—June 16, 1906. No. 77311.

Electrically-Operated Coke-Drawing Machines. Frank C. Perkins. Illustrations showing details of construction and method of operating of a plant at Uniontown, Pa. 1500 w. Elec Engr, Lond—June 1, 1906. No. 77265 A.

The Mechanical Handling of Hot Coke. George Frederick Zimmer. Deals with conveyors suitable for use in gas works, believing that larger conveyors of similar design may be adopted in coke-oven installations. Ills. 5000 w. Inst of Civ Engrs—No. 3568. No. 78023 N.

### Coke-Drawing.

Electrically-Operated Coke-Drawing Machines. Frank C. Perkins. Illustrated description of a machine in use at Uniontown, Pa., and its method of operation. 1500 w. Sci Am Sup—Aug. 4, 1906. No. 78426.

### Coke Oven.

A New By-Product Coke-Oven. R. Schorr. Illustrated description of an oven specially designed to coke lean coals and also non-coking fuels with the addition of oil, oil residues, coal-tar, molasses, &c. 500 w. Eng & Min Jour—Dec. 16, 1905. No. 73774.

Modern Features of the United Otto Coke Oven. Illustrated description extracted from a recently issued pamphlet. 2000 w. Ir Age—Feb. 22, 1906. No. 75226.

By-Product Coke Ovens in America; Past, Present, and Future. Edwin A. Moore. Deals with the Otto Hoffman system of by-product coke-ovens and their management, describing plants. Ills. 8900 w. Pro Engr's Club of Phila—July, 1906. No. 78597 D.

Coke Oven Construction. W. M. Judd. Gives a brief description of the "beehive" type of oven as constructed at the present time, with illustrations. Also discussion. 9000 w. Pro Engrs' Soc of W Penn—Oct., 1906. No. 80097 D.

The Koppers Coke Oven System (Ueber Koksofenanlagen System Koppers). H. Herbst. Illustrating an improved form of regenerative by-product coke oven, with complete details of construction and operation. 4000 w. Glückauf—Oct. 6, 1906. No. 79936 B.

# MINING AND METALLURGY

## Coke Plant

### Coke Plant.

The Colonial Coke Co.'s Plant. Illustrated detailed description of a plant in the region commonly known as the Lower Connellsville district. The mine turns its output into coke. 1700 w. Eng & Min Jour—Feb. 3, 1906. Serial. 1st part. No. 74838.

### Coking.

The Progress of Coke Manufacture in the Saar District (Die Fortschritte der Koksfabrikation im Saargebiet). Oskar Simmersbach. An account of the operation of by-product coke ovens, with tabulated data of dimensions and performance. 3000 w. Stahl u Eisen—Dec. 1, 1905. No. 73850 D.

### Colliery Equipment.

The Equipment of a Modern Colliery. F. W. Hardwick. Lecture before the Nat. Assn. of Colliery Mgrs. Discusses the choice of site, size of shafts, surface plant, sinking plant, winding engines, etc. Diagrams. 12000 w. Ir & Coal Trds Rev—April 6, 1906. No. 76086 A.

Some Notes on the Mechanical Equipment of Collieries. E. M. Hann. Illustrates and describes the lay-out of the Bargold Colliery of the Powell-Duffryn Steam Coal Co., and also a similar plan of the intended Penalltau pits of the same company. 3500 w. Inst of Mech Engrs—July 30, 1906. No. 78563 D.

The Work of the Mining Engineer in Connection with the Construction and Equipment of Bituminous Collieries and Coke Plants. William Glyde Wilkins. On the requirements of the constructing mining engineer of today. 1500 w. Ind Wld—June 28, 1906. No. 77750.

### Consolidation.

Consolidation of Five Large Coal Mines. J. Leggett Pultz. An illustrated account of a consolidation formed in the Pittsburg gas-coal district. 1500 w. Eng & Min Jour—Oct. 6, 1906. No. 79665.

### Culm.

The Culm-Handling Plant at the Queen Louisa Coal Mines at Zabrze, Upper Silesia (Die Einführung des Sandspülversatzes auf dem Staatlichen Steinkohlenbergwerk Königin Luise bei Zabrze, O. S.). H. Arbenz. An illustrated account of methods of handling and disposing of the spoil in the coal mines of Silesia. 10000 w. 6 plates. Glückauf—May 19, 1906. No. 77627 B.

### Deep Mines.

Considerations on Deep Coal Mines. George Farmer. Abstract of a paper read at meeting of the Inst. of Min. Engrs., London. Discusses the physical difficul-

## COAL AND COKE

## Electric Plants

ties encountered at great depths. 2000 w. Min Wld—July 7, 1906. No. 77850.

### Disaster.

Explosion at Courrières Colliery. An account of the terrible disaster in France on March 10, 1906. 2200 w. Col Guard—March 16, 1906. No. 75696 A.

The Coal Disaster in France. Donald F. Campbell. An illustrated article briefly describing the Pas de Calais mines and their equipment, where a disaster costing over 1200 lives, recently occurred. 1000 w. Min & Sci Pr—March 17, 1906. No. 75673.

The Courrières Disaster. James Ashworth. Information of the character and extent of the mines, the probable cause of the explosion, and illustrated description of rescue apparatus. Also editorial. 3000 w. Mines & Min—May, 1906. No. 76513 C.

### Electric Blasting.

Electric Blasting Apparatus, with Special Reference to its Use in Coal Mines. W. Maurice. The present number considers fuses and exploders. Ills. 2200 w. Elect'n, Lond—May 18, 1906. Serial. 1st part. No. 76989 A.

### Electrical Equipment.

Electrical Equipment of the Aberdare Collieries of the Powell Duffryn Company. C. P. Sparks. Illustrated description of the equipment of this group of collieries, 20 miles north-west of Cardiff. 2000 w. Col Guard—March 30, 1906. Serial. 1st part. No. 76011 A.

### Electric Plants.

The Installation and Working of Electric Plants at Collieries. S. T. Boam. Read before N. Assn. of Col. Mgrs. Considers the generation of steam and the engine, the dynamo or generator, system of distribution motors, etc. 3500 w. Ir & Coal Trds Rev—April 20, 1906. No. 76458 A.

How to Avoid Accidents with Electrical Machinery in Coal Mines. H. Morton Middleton. Aims to show that if care is taken with the selection and installation of the plant, and it is given intelligent supervision, it will prove the safest and most economical form of power that can be used in a colliery. 3500 w. Col Guard—March 16, 1906. No. 75695 A.

National Mining Company's Mines. Illustrated description of coal mines where electricity is applied to nearly every purpose below or above ground, and chain hauls are used in the main slope. 2000 w. Eng & Min Jour—March 10, 1906. No. 75461.

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## English Collieries

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### English Collieries.

Some Modern English Collieries. Brief descriptions of interesting collieries visited by the American Mining Engineers recently. 2500 w. Engr, Lond—Oct. 19, 1906. No. 80147 A.

### Experimental Mine.

An Experimental Colliery. Henry Briggs. Illustrates and describes the experimental mine of the new university of Birmingham, explaining its uses. 1600 w. Eng & Min Jour—Aug. 4, 1906. No. 78440.

### Explosion.

The Clydach Vale Explosion, South Wales. James Ashworth. An account of this explosion, showing weak points of watering, and of construction in safety lamps. Ills. 3700 w. Mines & Min—Nov., 1905. No. 73032 C.

### Explosives.

Bobbinite in Coal Mines. Gives evidence in regard to this explosive as used in coal mines, presented before the Home Office Committee. 8000 w. Ir & Coal Trds Rev—May 4, 1906. No. 76671 A.

### Filling.

The Hydraulic Filling of a Coalseam at Lens, Pas-de-Calais, France. Lionel E. Hill and Malcolm Burr. Abstract of a paper read before the Inst. of Min. and Met. Describes the process as applied at the colliery named. Ills. 2000 w. Col Guard—March 2, 1906. No. 75505 A.

### Firedamp.

Safety Lamp Gauzes and Flame Tests for Firedamp. J. Ashworth. Reports extensive experiments and tests made on a variety of lamps in the present number. Ills. 2000 w. Ir & Coal Trds Rev—Jan. 26, 1906. Serial. 1st part. No. 74884 A.

### Fuel Economy.

Fuel Economy at Bituminous Coal Mines in Pennsylvania. C. E. Watts. Reviews briefly the application of machinery to mining, showing that the equipment is not always economical, and pointing out causes of waste of energy. Describes the remedy applied at the Eureka mines, at Windber, Pa. Discussion. 5000 w. Pro Engrs' Soc of W Penn—Jan., 1906. No. 74540 D.

### Fuel Value.

Some Experiments on the Fuel Value of Bituminous Coal Ashes. Henry Fay and F. W. Snow. An account of experiments made to determine the exact amount of unburned coal being thrown away in ordinary soft coal ashes. The expense of recovery would exceed the profit. 1500 w. Tech Qr—Dec., 1905. No. 74586 E.

### Gases.

Some Practical Notes on the Detection and Estimation of Inflammable Gases in Mines by Means of Flame Caps. Prof. Charles Latham. Abstract of a paper before the Min. Inst. of Scotland. Points out improvements made in connection with safety lamps intended for flame cap testing. 2000 w. Col Guard—April 20, 1906. No. 76446 A.

### Haulage.

Endless Rope Surface Haulage at Shilbottle Colliery. Describes the system of haulage, giving map showing route, and illustrations. 2800 w. Ir & Coal Trds Rev—May 4, 1906. No. 76672 A.

The Alliance Rack Rail Locomotive Haulage System. Shows that for grades in coal mines some form of mechanical haulage more positive than a traction locomotive is required, and presents the advantages of the system named, giving an illustrated description. 4500 w. Ir & Coal Trds Rev—May 18, 1906. No. 77023 A.

### Hungary.

The Zyltal Mines of the Salgo-Tarjan Coal Mining Company (Die Zsylvtaler Gruben der Salgo-Tarjaner Steinkohlen Bergbau Aktiengesellschaft). Johann Adrieas & Aladar Blascheck. An illustrated account of the geology and workings of an important coal mining district in Hungary; with statistics of the output. Serial. Part I. 3000 w. Oesterr Zeitschr f Berg u Huttenwesen—Sept. 8, 1906. No. 79340 D.

### Illinois.

The Coals of Illinois. S. W. Parr. Reports an increase in the coal output, and gives information concerning the deposits, their character, etc. 1500 w. Eng & Min Jour—Jan. 13, 1906. No. 74384.

The Peabody Mines, Southern Illinois. R. S. Moss. A description of the Carterville seam, and especially of the No. 3 mine of the Peabody Coal Co., with illustrations. 900 w. Min Wld—July 21, 1906. No. 78089.

### Improvements.

Improvements in Operating Plant in the Rhenish-Westphalian Coal Mining District in 1905 (Neuanlagen im Betriebe der Rheinisch-Westfälischen Steinkohlen-gruben, 1905). E. Wex. A classified report of improvements in motive power, lighting, and machinery in the various mines of the Westphalian district. Serial. Part I. 4500 w. Glückauf—Oct. 13, 1906. No. 79938 B.

### India.

Indian Coalfields. Map and informa-



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## Indiana

tion furnished by R. R. Simpson of the Geological Survey of India. Reports ten new fields and the re-examination of two previously known. 2000 w. *Ir & Coal Trds Rev*—April 27, 1906. No. 76582 A.

## Indiana.

Indiana Coals. R. P. King. Read before the Indiana Engng Soc. Reviews the growth of the coal industry, the state ranking among the first six of the coal producing states. Gives information concerning the quality, heating value, etc. 3000 w. *Eng Rec*—Jan. 27, 1906. No. 74-772.

Improvements in Indiana Coal Mines. James Epperson. Extracts from the annual report for 1905, concerning improvements made by numerous companies, aggregating large sums of money. 1500 w. *Min Wld*—Sept. 1, 1906. No. 78948.

## Indian Territory.

Asphaltic Coals in the Indian Territory. W. R. Crane. Describes the deposits and the methods of prospecting and mining. Ills. 4200 w. *Mines & Min*—Jan., 1906. No. 74245 C.

Coal Mining in the Indian Territory. W. R. Crane. Describes mining methods where the coal and associated strata are more or less disturbed, and faults and folds, weak roof, much gas, and considerable water must be contended with. Ills. 2800 w. *Eng & Min Jour*—April 7, 1906. No. 75996.

The Coal Fields of the McAlester Quadrangle, Indian Territory. H. A. Everest. Gives a general outline of the development and history of the field, and a description of the coals, their location, quality, and the methods of mining. 3000 w. *Min Rept*—May 17, 1906. No. 76718.

Oil, Coal, and Gas in the Muscogee Quadrangle, Indian Territory. Reliable information of this portion of the territory. 1500 w. *Min Rept*—June 7, 1906. No. 77209.

## Lancashire.

Half a Century of Lancashire Coal Mining. Jno. Unsworth. Read before the Nat. Assn. of Colliery Mgrs. A review of mining conditions, production, accidents, wages, legislation, improvements, &c. 9500 w. *Ir & Coal Trds Rev*—March 16, 1906. No. 75809 A.

## Lignite.

Simpson Mine. E. D. Rust. Illustrated description of a large and well equipped lignite mine at Lafayette, near Denver, Colo. 2000 w. *Mines & Min*—April, 1906. No. 75963 C.

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## New Mexico

## Lignite.

Lignite Briquets. Elwyn Waller and H. Stanley Renaud. Illustrates and describes a system for the utilization of low-grade coal. 3500 w. *Eng & Min Jour*—Oct. 6, 1906. No. 79664.

The Lignite Coals of North Dakota. Frank Alonzo Wilder. Describes these deposits and gives a report of trial boiler tests, and of producer gas test. 2500 w. *Ec Geol*—July, 1906. No. 79840 D.

## Maryland.

Mining in the George's Creek Coalfield. F. W. Parsons. Gives briefly the history, describing the conditions and methods employed. 3500 w. *Eng & Min Jour*—Oct. 13, 1906. No. 79778.

## Methods.

A New Method of Coal Mining. Charlton Dixon. Analyzes the method in vogue at nearly all the mines in the Pittsburg district, showing its danger, cost and wastefulness, and describing a method believed to be a great advance. Ills. 3300 w. *Mines & Min*—Aug., 1906. No. 78490 C.

Mining Methods in the Western Interior Coal Fields. W. R. Crane. On the adaptation of methods to local needs, outlining some room-and-pillar methods. Ill. 2000 w. *Mines & Min*—Aug., 1906. Serial. 1st part. No. 78489 C.

## Mine Fire.

Fire at the Cambrian Collieries. Leonard Wilkinson Llewelyn. Abstract of a paper before the So. Wales Inst. of Engrs., describing the character of the explosion and fire, and the methods adopted to combat the poisonous gases and the conflagration. 4500 w. *Col Guard*—Aug. 17, 1906. No. 78849 A.

## Mine Stables.

Underground Stables. Illustrates types of stables built of wood, iron, or concrete, and discusses the proper arrangement. 2000 w. *Mines & Min*—May, 1906. No. 76511 C.

## Model Plant.

A Model Illinois Coal Mining Plant. Charles H. Smith. Illustrated description of No. 8, a new mine plant at Clifford, Illinois. 2000 w. *Min Wld*—Dec. 23, 1905. No. 74005.

## Natal.

Coal in Natal. A report of the coal industry, which is of importance, and information concerning the quality of the coals. 1800 w. *Engng*—Jan. 5, 1906. No. 74421 A.

## New Mexico.

Carboniferous Coal Measures in the Southwest. Charles R. Keyes. Informa-

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## Operation

tion concerning coals of true Carboniferous age, recently discovered in New Mexico. 600 w. Eng & Min Jour—June 16, 1906. No. 77309.

## Operation.

The Operation of a Coal Mine. Thomas A. Jackson. Discusses the essential principles in regard to production, transportation and preparation of the coal. 3500 w. Mines & Min—March, 1906. No. 75459 C.

The Springfield Coal Mine of the Peabody Coal Co., and the Method of Survey. Mr. F. Peltier. Abstract of a paper read at meeting of the Illinois Soc. of Engrs. & Survs. Describes this modern coal mining plant in Illinois. 1500 w. Eng News—March 8, 1906. No. 75437.

## Peat.

The Application of Peat-Fuel. L. A. Stillings. Gives information concerning peat and its use, the large deposits in the United States, and the methods of preparing it for fuel, describing some processes. 2500 w. Elec-Chem & Met Ind—Nov., 1905. No. 73071 C.

The Present Status of the Peat-Fuel Industry in the United States. A. Frederick Collins. An illustrated description of the new fuel plant at New Rochelle, N. Y., and general information concerning peat-fuel. 2500 w. Sci Am Sup—Nov. 18, 1905. No. 73205.

Peat as Fuel in the United States in 1905. Marius R. Campbell. Condensed from advance pages of Mineral Resources of the U. S. Reports the production, and tests made of both natural and machine peat. 1500 w. Eng News—Sept. 6, 1906. No. 79093.

## Philippines.

United States Enterprise in the Coal Trade of the Philippines. Oscar Halvorsen Reinhold. A review of the development of coal mining in the islands in connection with the United States government explorations. 4500 w. Engineering Magazine—Jan., 1906. No. 73891 B.

Philippine Coal Deposits. H. L. Wigmore. An illustrated article giving an account of diamond drilling in the Philippines and the development of the coal deposits of Batan Island. 7500 w. Mines & Min—July, 1906. No. 77905 C.

## Pit-Head Plant.

Pit-Head Plant of the Société des Mines de Houille de Bethune, France. Illustrated description of interesting arrangements in use at the mouth of Pit No. 10. The operation of unloading and reloading the cages is carried out by au-

## COAL AND COKE

## Russia

tomatic means. 1000 w. Engng—Aug. 17, 1906. No. 78854 A.

## Pittsburg.

Banning No. 2 Mine. Illustrated description of this coal mine near Pittsburgh, especially its system of endless rope haulage. 1400 w. Eng & Min Jour—Feb. 17, 1906. No. 75040.

## Pocahontas.

The Pocahontas Collieries Company. F. W. Parsons and William Leckie. An illustrated account giving the system of mining adopted for a monster vein of coal. 2500 w. Eng & Min Jour—Oct. 27, 1906. No. 80107.

## Queensland.

The Coal Measures Near Townsville. Lionel C. Ball. A report of an examination made of this district in Queensland and the results. 3500 w. Queens Gov Min Jour—Aug. 15, 1906. No. 79580 B.

## Rescue.

The Organization and Training of Rescue Brigades. H. Meyer, in *Glückauf*. Considers the training of men in the use of the regenerative type of apparatus. 2200 w. Col Guard—May 25, 1906. No. 77135 A.

## Rescue Appliances.

Rescue Appliances in Collieries. Gives illustrations of types of safety appliances, with descriptive notes, and information concerning experiments made in England. 2200 w. Col Guard—March 30, 1906. No. 76012 A.

The Fleuss-Davis Self-Contained Breathing Apparatus. Illustrated description of this recently improved apparatus. The principle is the regeneration of exhaled breath in a special reservoir carried by the wearer, by passing it through caustic soda and simultaneously renewing the supply of oxygen. 1500 w. Engng—April 13, 1906. No. 76300 A.

## Report.

Coal. Reports of the production and trade, from all parts of the United States, by Frederick Hobart, E. Morrison, George H. Cushing, S. F. Luty, L. W. Friedman, J. E. Sheridan, and William Nelson Page. 15000 w. Eng & Min Jour—Jan. 6, 1906. No. 74272.

## Review.

Coal Mining in 1905. E. W. Parker. Gives details of production from the various coal districts of the United States, showing great activity. 2400 w. Min. Wld—Jan. 27, 1906. No. 74776.

## Russia.

The Coal and Carboniferous Deposits of Far Eastern Russia (*Die Fossilien*

# MINING AND METALLURGY

## Separator

Kohlen und Kohlenstoffverbindungen des fernen Ostens Russlands). A. M. Ossendowsky. A tabulated report of the various coal, lignite, peat, and petroleum resources of Siberia, Manchuria, and Sakhalin, from a chemical viewpoint. Three articles. 8000 w. Oesterr Zeitschr f Berg u Hüttenwesen—June 23, 30, July 7, 1906. No. 78150 each D.

## Separator.

A Revolving Spiral Separator. Illustrated description of a new apparatus being installed for removing slate from anthracite coal at the Truesdale breaker of the D., L. & W. Co. 1200 w. Mines & Min—Jan., 1906. No. 74250 C.

## Shipping.

A New Anti-Breakage Coal Shipper. Illustrated description of an appliance invented by James Rigg, aiming to avoid breakage in the trainshipping of coal. 1000 w. Col Guard—Jan. 12, 1906. No. 74521 A.

## Spontaneous Ignition.

The Spontaneous Ignition of Coal. Vivian B. Lewes. Abstract of a lecture before the British Soc. of Arts. Considers the danger from this trouble when coal is stored in bulk, the means of preventing, and methods of extinguishing such fires. 1400 w. Eng & Min Jour—July 14, 1906. No. 77944.

## Sprinkling Plant.

Safety Arrangements for the Prevention of Colliery Fires and Explosions of Fire-Damp in German Coal Mines. Illustrates and describes one of the sprinkling plants used in the Westphalian coal mines. 900 w. Ir & Coal Trds Rev—March 23, 1906. No. 75915 A.

## Storage.

Ransom Coal-Storage Plant. Illustrates and describes a plant arranged for storing a half-million tons of coal and re-loading it without hand work. 3000 w. Mines & Min—July, 1906. No. 77906 C.

## Stripping.

Coal Mining by Open Stripping in Pennsylvania. F. W. Parsons. An illustrated article describing the method of working a coal seam in the Hazleton district. 1400 w. Eng & Min Jour—June 30, 1906. No. 77745.

## Submarine Mines.

Submarine Coal Mining. Richard H. Brown. From *Jour. of the Min. Soc. of Nova Scotia*. Particulars connected with the operation of the largest of the six collieries of Cape Breton, now working under water. 1600 w. Min Rept—July 12, 1906. No. 77955.

## COAL AND COKE

## Transformation

Submarine Coal Mining. Richard H. Brown. Read before the Min. Soc. of Nova Scotia. Describes the operations of a colliery on Cape Breton Island, working under water. 1600 w. Aust Min Stand—Sept. 19, 1906. No. 80122 B.

## Submarine Mining.

Submarine Coal Mining. A. Selwyn-Brown. Information concerning the dangerous risks in the submarine mines of New South Wales, due to the thinness and insecurity of the cover. 500 w. Eng & Min Jour—Nov. 18, 1905. No. 73237.

## Submerged Coal.

Submerged Salt-Water Storage for Coal. W. H. Beehler. Shows the dangers and losses caused by fires in coal stored in bulk, and urges the experiment of storing under salt water, giving information bearing on the subject. 4000 w. Pro U S Nav Inst—June, 1906. No. 78029 G.

## Testing.

Coal Testing. Myles Brown. On the value of true sampling, the methods and articles required; the apparatus for the analysis of coal, estimation of moisture, &c. 3000 w. Mines & Min—Nov., 1905. Serial. 1st part. No. 73034 C.

Coal Testing. Roland C. Wild. Briefly describes methods of testing for the determination of moisture, ash, and calorific value, and urges the importance of such tests. 2700 w. Elec Rev, Lond—Aug. 17, 1906. No. 78842 A.

## Thin Veins.

Mines Nos. 1 and 2 of the National Mining Co. James Collins. Illustrated description of the two best equipped mines in the Pittsburg thin-vein district. 2500 w. Mines & Min—Nov., 1905. No. 73030 C.

## Tioga County.

A Brief History of Mining in Tioga County, Pennsylvania. Anton Hardt. From an address before the Historical Society at Wellsboro, Pa. Gives facts showing how much prosperity is due to the coal deposits. 2700 w. Mines & Min—June, 1906. No. 77184 C.

## Transformation.

Hypothesis to Account for the Transformation of Vegetable Matter into the Different Grades of Coal. Marius R. Campbell. Gives a working hypothesis embodying the provisional conclusions of the writer, in explanation of the various grades found in different localities. Heat is considered the principal cause, affected by conditions. 3000 w. Ec Geol—Oct., 1905. No. 74590 D.

# MINING AND METALLURGY

## Transvaal

### Transvaal.

The Coal Resources of the Transvaal. A report of the four districts producing coal, with illustrated descriptions of the collieries and general information. 3000 w. Ir & Coal Trds Rev—Aug. 17, 1906. No. 78861 A.

### United Kingdom.

The Coal Resources of the United Kingdom. J. L. Pultz. Notes from the final report of the Royal Commission on Coal Supplies, 1905. 1200 w. Eng & Min Jour—July 7, 1906. No. 77845.

### Utah.

The Utah Coal Fields of the Wasatch, Near Grass Creek and Weber Cañon. Prof. Arthur Lakes. Illustrated description of the thick veins of lignitic coal with numerous faults. 1600 w. Mines & Min—Sept., 1906. No. 78915 C.

### Washeries.

Anthracite-Washeries. George W. Harris. A discussion of the waste in the breaker, represented by the old culmbanks, and the steps taken to diminish it. 4000 w. Ills. Am Inst of Min Engrs—Nov., 1905. No. 73962.

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## British Columbia

### Westphalia.

The Coal Measures of the Bochum District between Dortmund and Camen (Das Flozfuhrende Steinkohlengebirge in der Bochumer Mulde zwischen Dortmund und Camen). Heinrich Meyer. A general geological study of the district, with especial reference to the coal measures. Maps. 8000 w. 3 plates. Glückauf—Sept. 8, 1906. No. 79342.

### West Virginia.

The Loup Creek Colliery Company. George W. Harris. An illustrated description of this mining property in West Virginia, the methods of mining, coke oven equipment, &c. 3800 w. Eng & Min Jour—Dec. 9, 1905. No. 73643.

### Workings.

Late Methods of Rib Drawing. Elias Phillips. Read before the Coal Min. Inst. of America, at Pittsburg, Pa. Illustrates and describes improved methods applied in the Connellsville seam, discussing the importance of taking out a large percentage of coal. 3200 w. Mines & Min—March, 1906. No. 75460 C.

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### Alaska.

The Copper River District. L. A. Levensaler. Describes the copper deposits and the mines of this district. Gold, silver and other metals are associated. 2000 w. Cal Jour of Tech—Feb., 1906. No. 75961 C.

Ketchikan, Alaska. H. W. Turner. Describes and illustrates this port of entry and the ores found in these islands. Copper is the most abundant valuable mineral. 1500 w. Min & Sci Pr—Aug. 11, 1906. No. 78650.

### Analysis.

The Estimation of Copper in Ore and Matte. O. H. Packer. Gives detailed description of the aluminum-strip-cyanide method for determining copper at the mine or smelter. 2000 w. Min & Sci Pr—Sept. 1, 1906. No. 79071.

### Arizona.

In the Globe, Arizona, District. An illustrated report of properties in this copper district. 1800 w. Min Rept—April 26, 1906. No. 76406.

The Olive and Mineral Hill Camps of Pima County, Arizona. A descriptive account of the camps of this district, and the copper and lead-silver ores. 3300 w. Min Rept—May 31, 1906. No. 77089.

Arizona. An illustrated article reporting the different districts. Gains of thirty-

six million pounds of copper are given over the previous year. 6500 w. Min Wld. Jan. 27, 1906. No. 74784.

### Assay.

The Quincy Mine Assay Office. C. W. Macdougall. Describes in detail the methods of determining the percentage of copper in waste sands, and other mineral deposits. 2000 w. Eng & Min Jour—April 7, 1906. Serial. 1st part. No. 75995.

The Electrolytic Assay of Lead and Copper. George A. Guess. An illustrated description of the writer's method. 1500 w. Am Inst of Min Engrs—Nov., 1905. No. 73960.

### Australia.

The Wallaroo and Moonta Mines. L. Hancock. Information concerning these copper mines of South Australia, and their operation. 700 w. Eng & Min Jour—Feb. 10, 1906. No. 74942.

### Blast Furnaces.

The Washoe Plant of the Anaconda Copper-Mining Co. in 1905. L. S. Austin. Illustrated detailed description of the numerous departments of this extensive plant, the construction, operation, advantages, etc. 16000 w. Bul Am Inst of Min Engrs—July, 1906. No. 78250 D.

### British Columbia.

Copper Deposits of Eschelon Moun-

# MINING AND METALLURGY

## Buss Tables

tain, B. C. Horace F. Evans. Describes the occurrence, topography, etc., and gives information concerning conditions, and the development work. 1800 w. Min Wld—Sept. 8, 1906. No. 79046.

The Granby Mine, British Columbia. An illustrated description of this low-grade copper property and its working. 1200 w. Eng & Min Jour—Sept. 8, 1906. No. 79058.

## Buss Tables.

Tin-Wolfram-Copper Ores. F. Dietzsch. Describes the Buss swinging-table treatment processes of these ores at the mines of East Cornwall, Eng. Ills. 2500 w. Aust Min Stand—July 11, 1906. No. 78661 B.

## Chile.

The Metallurgy of Copper in Chile. A. Gmelhing. Abstract from Oester. Zeit. Describes the processes used in roasting of copper matte, the utilization of the escaping gases for the production of sulphuric acid, and the extraction of copper from low-grade ores by the acid thus produced. 2800 w. Eng & Min Jour—Sept. 8, 1906. No. 79061.

## Coeur d'Alenes.

The Copper Deposits of the Coeur d'Alenes. A description of this mining district in Idaho with outline map showing copper belt, and an account of development. 3500 w. Min Wld—Jan. 20, 1906. No. 74490.

## Concentration.

Concentration Methods at the Old Dominion, Globe, Arizona. H. J. Baron. Plan and description of the 500-ton capacity copper concentration plant, and the methods employed. 1100 w. Min Rept—Oct. 4, 1906. No. 79050.

## Converter.

Copper Converter Melting Its Own Matte. E. Jacobs. Describes the operation of a copper converter under unusual conditions. 5000 w. Eng & Min Jour—Sept. 8, 1906. No. 79057.

## Copper.

The Reign of Copper. Percy E. Barbour. Part I gives an historical review of the uses made of copper from the earliest times, and its commercial importance. Part II gives information of the copper mining districts of the United States. 5000 w. Jour Worcester Poly Inst—March, 1906. No. 75515 C.

## Copper Slag.

A Co-operative Analysis of a Copper Slag. Thorn Smith. A report showing the need of better chemical work by practical demonstration. 4000 w. Elec-Chem & Met Ind—Nov., 1905. Serial. 1st part. No. 73069 C.

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### Copper Trade.

See Industrial Economy.

### Cornish Mines.

A Mine Below the Sea, with a Sketch of the Cornish Lodes. Arthur Lakes. An illustrated description of the Botallack mine which yields tin and copper with information concerning the Cornish mines. 900 w. Min Wld—May 5, 1906. No. 76541.

### Crushing.

Gigantic Crushing of Copper Ore. A. S. Atkinson. Report of the steam stamp of 700 tons per day capacity, and of other methods of crushing in the Lake Superior region. 2500 w. Mines & Min—March, 1906. No. 75453 C.

### Cyanides.

The Double Cyanides of Copper. Leonard M. Green. Explains tests for determining the cupric- and cuprous-potassium cyanides. 900 w. Eng & Min Jour—Nov. 18, 1905. No. 73243.

### Determination.

Notes on Technical Determination of Copper by the Cyanide Method. Irving Miller. Gives a few of the practical details of manipulation in connection with the cyanide assay of copper ores and products. 1200 w. Cal Jour of Tech—Dec., 1905. No. 74080 C.

### Distillation.

The Distillation of Copper (Sur la Distillation du Cuivre). Henri Moissan. A discussion of the volatilization of copper in the electric furnace, and the nature of the condensed vapor. 2000 w. Comptes Rendus—Nov. 27, 1905. No. 73829 D.

### Drilling.

Drilling Practice in the Lake Superior Copper Mines. W. R. Crane. Describes the practice giving tabulated data of results obtained. 900 w. Eng & Min Jour—Sept. 8, 1906. No. 79056.

### Electro-Metallurgy.

See Electrical Engineering, Electrochemistry.

### Electric Refining.

See Electrical Engineering, Electrochemistry.

### Enrichment.

Secondary Enrichment in Ore-Deposits of Copper. James Furman Kemp. Reviews the chief copper ores, with comments upon them, aiming to stimulate close study of their succession in formation. 5000 w. Ec Geol—Oct., 1905. No. 74589 D.

### Extraction.

Extraction of Copper from Pyrites Cinders or Poor Ore, with Direct Production of Sulphate of Copper from the Lixiviation Liquids. Carl Milberg.

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## Fusing Point

Translated from *Rassegna Mineraria*. Gives the main points of the process and the results. 2300 w. *Min Jour*—June 30, 1906. No. 77889 A.

## Fusing Point.

Notes on the Solidification of Copper (Remarques sur la Solidification du Cuivre). P. Dejean. A record of experimental researches, showing that pure copper solidifies at 1085 degrees C. 5000 w. *Revue de Metallurgie*—May, 1906. No. 77666 H.

## Gribbell Island.

Gribbell Island—Its Geology and Mining Operations. W. M. Brewer. Information concerning this island, which is about 150 miles north of Vancouver Island. The development of two copper mining companies is described. 2500 w. *B C Min Rec*—June, 1906. No. 78085 B.

## Japan.

The Copper Mines of Japan. Illustrations and information concerning the mines, and their workings, production, etc. 1000 w. *Eng & Min Jour*—June 2, 1906. No. 77078.

## La Cananea.

La Cananea Mining Camp. Dwight E. Woodbridge. Illustrates and describes the mines, mills and smelter, the methods, development and interesting features of this copper mining property in Mexico. 3000 w. *Eng & Min Jour*—Oct. 6, 1906. No. 79659.

## Lake Superior.

Copper Mining on Lake Superior. J. Parke Channing. An illustrated account of recent development. 2000 w. *Min & Sci Pr*—March 24, 1906. No. 75847.

On the Ancient Copper Mines of Lake Superior. Alvinus Brown Wood. Description of an ancient pit on the Quincy mine location. 3300 w. *Bul Am Inst of Min Engrs*—March, 1906. No. 76120.

History of the Lake Copper District. An interesting account of the early work of Dr. Douglass Houghton, and the development of what has proved one of the most valuable mining fields in the world. 2500 w. *Min Wld*—May 12, 1906. No. 76641.

Lake Superior Copper. Horace J. Stevens. A report of the Lake Superior copper industry and the great amount of development work under way. 1700 w. *Min Jour*—Oct. 20, 1906. No. 80137 A.

Ore Breaking at Lake Superior. W. R. Crane. An illustrated description of the methods employed in the copper mines. 2800 w. *Eng & Min Jour*—Oct. 27, 1906. No. 80105.

The Calumet & Hecla Company's Properties. The first of a series of illustrated

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## Montana

articles on this prominent copper district, reviewing the past, discussing the present and the future outlook. 1600 w. *Min Wld*—Oct. 13, 1906. Serial. 1st part. No. 79764.

Five Years Progress in the Copper Country. J. F. Jackson. Abstract of a paper read before the Lake Superior Min. Inst. Reviews the development since 1901, and important work accomplished. 2500 w. *Min Wld*—Aug. 18, 1906. No. 78645.

## Low-grade Ores.

Ely, Nevada. Arthur H. Halloran. A description of this region and the deposits of low-grade copper ores, the mine workings, etc. 2000 w. *Min & Sci Pr*—Jul. 5, 1906. No. 77954.

## Matte.

The Determination of Matte. John P. Walker. Gives the formula used in calculating the grade of matte to be expected from a calcine of given percentage of copper and sulphur, and explains its application. 1000 w. *Eng & Min Jour*—May 5, 1906. No. 76546.

Matte Converting. Hiram W. Hixon. Reviews the development of the converter as applied to copper matte, giving the types used by different companies, and describing the practice of converting. 3000 w. *Eng & Min Jour*—Aug. 4, 1906. No. 78438.

## Mexico.

Plant of the Cananea Con. Copper Co., Cananea, Sonora, Mexico. O. P. Findley. Illustrated description of an efficient plant averaging about 6,000,000 lbs. per month. 1800 w. *Min & Sci Pr*—Nov. 18, 1905. Serial. 1st part. No. 73473.

Growth of the Copper Industry in Mexico. Information concerning the mines, production, etc., showing Mexico to be the second largest of the world's producers. 1000 w. *Min Rept*—April 12, 1906. No. 76058.

Los Pilares Mine, Nacozari, Mexico. Samuel Franklin Emmons. A geological study of this copper mine and its deposits, giving its location. 1115. 5000 w. *Ec Geol*—July, 1906. No. 79836 D.

## Mines.

Britannia Copper Syndicates, Mines and Concentrating Works at Howe Sound, B. C. E. Jacobs. Illustrates and describes the mines, concentrating plant, &c., giving the history. 7500 w. *B C Min Rec*—Nov., 1905. No. 73737 B.

## Montana.

Copper at Butte, Montana. Arthur H. Halloran. An illustrated article describing the flourishing copper industry, &c.

# MINING AND METALLURGY

## Mount Lyell

effect on the appearance of the country, the deposition of the ores, and related matters of interest. 2400 w. *Min & Sci Pr*—Aug. 11, 1906. No. 78649.

## Mount Lyell.

The Mount Lyell Copper Mine. S. A. Ionides. Illustrated description of this low-grade copper mine on the west coast of Tasmania, and the method of extraction. 1000 w. *Min & Sci Pr*—June 30, 1906. No. 77858.

## Mount Morgan.

The Mount Morgan Mine. An illustrated description of recently completed copper treatment works at this mine in Queensland. 3000 w. *Queens Gov Min Jour*—Feb. 15, 1906. No. 75892 B.

## Nevada.

Ely, Nev., and Its Copper Properties. Col. W. A. Root. Information of this region and the companies operating. Ills. 1300 w. *Min Wld*—Sept. 29, 1906. No. 79567.

## New Jersey.

The Copper Deposits of New Jersey. N. S. Keith. Principally an illustrated description of the Schuyler mine at Arlington, and the Pahaquarry mine and property. 3000 w. *Min Mag*—June, 1906. No. 77328 C.

## New Mexico.

The Burro Mountain District. Illustration, with description of this district. The chief metal is copper, but a pay deposit of lead-silver ore occurs, and also a high grade lead ore. 2400 w. *Min Rept*—May 24, 1906. No. 76974.

The Burro Mountain Copper District. S. S. Lang. A description of the mining operations in this district in Grant Co. N. M., the occurrence of the ore, etc. 1200 w. *Eng & Min Jour*—Sept. 1, 1906. No. 78938.

## New South Wales.

Great Cobar Copper Mine (N. S. W.). C. H. Cropper. Read before the Sydney Min. Engng. Soc. Describes and illustrates the working and timbering the stopes. 1700 w. *Aust Min Stand*—March 14, 1906. No. 76092 B.

## Nickel Ores.

Genetic Relations of Some Nickel-Copper Ores. Charles W. Dickson. Read before the Can. Min. Inst. Briefly reviews the geological relations of nickel ores in general, and discusses the deposits of St. Stephen, N. B., and Sohland, Germany. 7800 w. *Can Min Rev*—May, 1906. No. 76973 B.

## Ore Bodies.

Secondary Enrichment Upward. Courtenay de Kalb. The writer's explanation

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## Poland

of peculiar phenomena found in the copper deposits on the north shore of Lake Huron. 1200 w. *Min & Sci Pr*—Aug. 11, 1906. No. 78651.

## Ore Deposits.

Genesis of the Ore-Deposits at Birmingham, Utah. J. M. Boutwell. A statement on the genesis of the copper- and lead-deposits, with conclusions. Ills. 12000 w. *Am Inst of Min Engrs*—Nov., 1905. No. 73956 D.

Sketch of the Geology and Ore Deposits of the Cochise Mining District, Cochise County, Arizona. L. O. Kellogg. An account of this district and its ores of copper minerals and wolframite. 3000 w. *Ec Geol*—July, 1906. No. 79838 D.

## Ore Treatment.

Note on the Ammonia-Copper-Cyanide Process. E. Le Gay Brereton. A report of experimental investigations and results, which show that under certain conditions cuprous potassium cyanide in an ammoniacal solution is broken up with the liberating of an alkaline cyanide. 1500 w. *Inst of Min & Met*—March 15, 1906. No. 76995 N.

Note on the Ammonia-Copper-Cyanide Process. E. Le Gay Brereton. H. L. Sulman's discussion of this paper. 1700 w. *Inst of Min & Met*—March 15, 1906. No. 76997 N.

## Output.

The World's Copper Output for the Past Twenty-five Years. John B. C. Kershaw. Gives information relating to the output of raw material by the twelve leading copper-producing countries during the last twenty-five years. 3500 w. *Cassier's Mag*—Sept., 1906. No. 79253 B.

## Pacific Coast.

Observations Relative to the Occurrence of Copper Ore on the Pacific Coast. William M. Brewer. An outline of the character and extent of the deposits on Vancouver Island and other portions of the Pacific Coast. 4000 w. *B C Min Rec*—Aug., 1906. No. 79489 B.

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The Copper Deposits of Ica and Nazca, Peru. Frederick G. Fuchs. Abstract translation from *Boletín del Cuerpo de Ingenieros de Minas del Perú*. Gives a résumé of observations made in the copper-bearing regions, and a description of the deposits. 1500 w. *Min Jour*—Sept. 1, 1904. No. 79134 A.

## Poland.

The Copper Mines and Electrolytic Copper Works at Miedzianka (Die Kupfergruben und die Elektrolytische Kupferhütte in Miedzianka). W. Stoeger.

# MINING AND METALLURGY

## Precipitation

Illustrating the use of the pneumatic hammer in mining; also the roasting furnaces and electrolytic baths. 2000 w. Oesterr Zeitschr f Berg u Hüttenwesen—July 28, 1906. No. 78739 D.

## Precipitation.

Copper Precipitation Plants at Butte. An account of the commercial extraction of copper from mine and tailings seepage waters by the use of scrap iron and tin as precipitants. 2000 w. Min Rept—Dec. 21, 1905. No. 74009.

## Production.

Arizona and Sonora. Dwight E. Woodbridge. The present article discusses the production of copper, and gives information concerning several of the districts. Ills. 1200 w. Eng & Min Jour—May 12, 1906. Serial. 1st part. No. 76605

The Direct Production of Copper. An illustrated detailed description of the Cowper-Coles centrifugal process for electrically depositing copper. 1700 w. Engng—May 18, 1906. No. 77013 A.

## Quebec.

Copper Deposits of the Eastern Township of Quebec. John Alexander Dresser. Map of the district, with account of the early work, a classification of the deposits, and a few of the characteristics of the ore bodies included in the first class. 2800 w. Ec Geol—March, 1906. No. 76946 D.

## Recovery.

The Recovery of Copper from Mine Drainage. Philip Argall. Briefly reviews the history of the precipitation of copper from mine drainage, which has been established about 200 years in Europe, and recently introduced in the western mines of the United States. 2500 w. Min & Sci Pr—May 19, 1906. No. 76981.

The Recovery of Copper from Mine-Drainage. Philip Argall. Describes the best practice for the recovery of copper from mine-drainage in the early seventies. 3000 w. Min & Sci Pr—July 28, 1906. No. 78432.

## Refining.

Electrolytic Copper. Lawrence Adicks. Discusses the subject of the electrolytic refining of copper, especially from the point of view of the multiple system of refining. 4000 w. Jour Fr Inst—Dec., 1905. No. 73933 D.

Cowper-Coles Centrifugal Process. J. B. Van Brussel. A novel electrolytic process for the simultaneous refining of copper and shaping the finished product. Ills. 1600 w. Mines & Min—Oct., 1906. No. 79629 C.

The Knorr Method of Determining

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## Smelting

Arsenic and Antimony in Refined Copper. P. Butler. An explanation of this method. 700 w. Can Min Rev—Oct., 1906. No. 80016 B.

## Refinery.

The Tacoma Copper Refinery. Day Allen Willey. Illustrated description of the plant and its operation. 500 w. Eng & Min Jour—July 28, 1906. No. 78280.

## Refinery Plant.

Copper Refinery Plant for Martin's Direct Rolling Process. H. J. Martin. Plan and description with summary of advantages. 2500 w. Foundry—Feb. 1906. No. 75207.

## Rhodesia.

Some Copper Deposits in Rhodesia. C. Brackenburgh. Describes deposits in South Eastern Rhodesia, examined by the writer. 4000 w. Inst of Min & Met—May 17, 1906. No. 77005 N.

## Secondary Enrichment.

The Secondary Enrichment of Copper-Iron Sulphides. Thomas T. Read. Reviews the opinions advanced by various writers, and reports results of experimental work made to imitate natural conditions. 2500 w. Bul Am Inst of Min Engrs—March, 1906. No. 76122.

## Separation.

Improvements in Nickel-Copper Separation. Ambrose Monell describes an improvement in the method of separating nickel and copper sulphides, as practiced at the Oxford works. 1200 w. Eng & Min Jour—Dec. 16, 1905. No. 73770.

## Siberia.

The Spassky Copper Mine, Ltd. Edward Walker. Gives details of the location and history of this mine in Siberia, describing the latest developments. 1200 w. Map & plan. Eng & Min Jour—Dec. 30, 1905. No. 74107.

## Smelting.

The Constitution of Mattes Produced in Copper-Smelting. Allan Gibb and R. C. Philp. Report of research work, both from a chemical and physical standpoint, of the constitution of mattes produced in copper smelting, the investigation involving both synthesis and analysis. 5200 w. Am Inst of Min Engrs—Nov., 1905. No. 73957 D.

Estimation of Copper by Titration with Potassium Cyanide. Describes this method and some of its working details, as used in the laboratory of one of the largest Montana smelters. 1500 w. Eng & Min Jour—April 21, 1906. No. 76162.

The Arizona Smelting Company's Plant in Yavapai County, Arizona. Illustrates and describes a plant compris-



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## Smelting

ing both copper and lead smelting works, and a concentrating plant of 400 tons capacity. 2400 w. *Min Rept*—March 29, 1906. No. 75869.

The Cost of Smelting Copper Ore. G. F. Beardsley. Information intended for mining men who may be trying to figure out the costs of ore treatment by blast-furnace methods. 1500 w. *Eng & Min Jour*—Sept. 1, 1906. No. 78939.

Pyrite Smelting Without Coke. Lewis T. Wright. On the extraction of copper from cupriforous pyrite, reviewing the English method, and giving an account of results obtained by the writer. 3000 w. *Min & Sci Pr*—Feb. 24, 1906. No. 75327.

A New Method of Smelting Butte Ores. William A. Heywood. Describes the application of the Baggally process to the smelting of copper ores. 3000 w. *Min & Sci Pr*—April 28, 1906. No. 76639.

The Colorimetric Estimation of Copper in Slags. H. M. Kimball. Gives a simple method of running the daily slag samples for copper. 700 w. *Eng & Min Jour*—May 19, 1906. No. 76728.

The Kiddie Hot-Blast System for Copper-Smelting Furnaces. E. Jacobs. Illustrated description of this system and its application at the Tyee Copper Company's smelting works. 2500 w. *Eng & Min Jour*—Sept. 29, 1906. No. 79552.

## Sudbury.

Notes on the Origin of the Sudbury Ores. David H. Browne. A study of the ores and of the theories explanatory of their origin, with the writer's conclusions. 2500 w. *Ec Geol*—March, 1906. No. 76948 D.

On the Origin and Relations of the Nickel and Copper Deposits of Sudbury, Ontario, Canada. Alfred Ernest Barlow. Gives a historical résumé of the literature relating to this mining district, describing the ore deposits. 4000 w. *Ec Geol*—March, 1906. No. 76947 D.

## Tailings.

The Cyanide Treatment of Cupriforous

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## Alaska

Tailings by the Sulphuric Acid Process. W. S. Brown. Describes the treatment of tailings that come principally from Cobbar, N. S. W. Reviews the operations. 2000 w. *Inst of Min & Met*—March 15, 1906. No. 76994 N.

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The Utah Copper Company's Mine and Mills. An illustrated description of the mines, mining system, and method of milling. The caving system of mining is used. 3000 w. *Eng & Min Jour*—Sept. 8, 1906. No. 79055.

Bingham Canyon, Utah. An illustrated account of these copper producing mines and their discovery. They were first worked for their lead ores and gold ores. 2800 w. *Eng & Min Jour*—Aug. 18, 1906. No. 78633.

Modern Mining at Alta, Utah. Leroy A. Palmer. An account of the revival of an old camp, producing copper, lead, gold and silver, as well as other ores of value. 111s. 4500 w. *Mines & Min*—May, 1906. No. 76509 C.

## Virginia.

The Virginia Copper Deposits. Walter Harvey Weed and Thomas Leonard Watson. Gives the results of an examination of these deposits, and a microscopic study of the rocks and ores. 111s. 6000 w. *Ec Geol*—Feb., 1906. No. 75840 D.

## Volumetric Method.

A New Volumetric Method for Copper and the Ores of Copper. Alfred Adair. The method is based on the precipitation of sub-sulphocyanide of copper from its solutions under conditions which have been found to give constant results. 2000 w. *Jour Chem, Met & Min Soc of S. Africa*—Dec., 1905. No. 75079 E.

## Works.

The Nichols Copper Works. O. Perfaehl. Translated from *Zeit. f. Berg-, Hütten u. Salinenwesen*. Brief description of extensive works at Laurel Hill, Long Island, N. Y., where crude copper, containing precious metals, is refined by electrolysis on the series system. 800 w. *Eng & Min Jour*—Feb. 17, 1906. No. 75036.

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## Africa.

Experimental Work in African Gold Mines. George E. Walsh. Describes new methods of grinding, and application of the cyanide process, filter pressing, etc. 2500 w. *Mines & Min*—June, 1906. No. 77186 C.

Rand Metallurgical Practice and Re-

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## Alaska.

Recent Publications on Alaska and Yu-

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## Amalgamation

kon Territory. Alfred Hulse Brooks. A discussion of the literature dealing with this region, that has appeared during the past six months. The metalliferous deposits are first discussed; followed by a brief summary of the literature on the coal fields. 6500 w. *Ec Geol*—Feb., 1906. No. 75842 D.

Gold-Mining in Alaska. Editorial, describing the deposits and giving an account of the difficulties in the different districts. 3000 w. *Engng*—April 27, 1906. No. 76573 A.

Vein Mining in Alaska. Chester W. Purington. Divides Alaska into three provinces, and discusses the prospects for vein mining in each. 1200 w. *Min & Sci Pr*—May 12, 1906. No. 76721.

Mining in Ketchikan District, Alaska. William M. Brewer. Reviews the past history of this district, and explains present conditions. 2000 w. *Eng & Min Jour*—Sept. 8, 1906. No. 79059.

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The Separation of Silver from Sulphide in Amalgamation Processes (Ueber die Abscheidung des Silbers aus Schwefelsilber in Amalgamationsverfahren). Tosio Watanabe. A review of practice in Europe and America in comparison with results at Sado, in Japan. 2000 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—Nov. 11, 1905. No. 73346 D.

The Amalgamation of Gold Ores. Thomas T. Read. Explains the nature of an amalgam, and discusses the amalgamation process and the influence of temperature. Ills. 10000 w. *Bul Am Inst of Min Engrs*—May, 1906. No. 77177 D.

## Ancient Mines.

A Historic Mine. An account of the Salida gold and silver mines of Sumatra, which are to be worked by modern methods. Ills. 3000 w. *Min Jour*—Oct. 20, 1906. No. 80136 A.

## Arizona.

Revival of Gold Mining in the Clifton-Morenci, Arizona District. This district in 1905 ranked second among the copper producing sections of the territory, and now a number of the properties are producing gold. Reports developments. 2200 w. *Min Rept*—April 19, 1906. No. 76175.

## Assaying.

Routine Assaying on the Rand. A. Whitby. Remarks on the importance of the work in the mine assay office, with a sketch plan of a serviceable building for a 200-stamp mill, the equipment, the actual work of assaying, etc. Short discussion. 7000 w. *Jour of Chem, Met,*

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Assaying Argentiferous-Tin-Copper Alloys. P. J. Thibault. Report of an unsuccessful attempt to apply the method used for the dry determination of silver in tin-lead alloys and metallic tin, to the alloys named. 700 w. *Aust Min Stand*—Nov. 15, 1905. No. 74083 B.

Some Assay Results on Resampled Ores. Howard C. Parmelee. Read before the W. Assn. of Tech., Chem. & Met. Gives tabulated statement of results, and deductions drawn. Also discussion. 3000 w. *Min Jour*—Dec. 2, 1905. No. 73684 A.

Notes on Gold Assay Methods (Beiträge zum Goldprobiervverfahren). Leopold Schneider. A review of the development of assaying processes for the separation of gold, with especial reference to silver and lead alloys. Two articles. 5000 w. *Oestern Zeitschr f Berg u Hüttenwesen*—Feb. 17, 24, 1906. No. 75738 each D.

The Assay of Cyanide Solutions. William Magenau. Describes a method for rapid determination of gold in cyanide solutions; also gives a summary of other methods. 2800 w. *Min & Sci Pr*—April 14, 1906. No. 76179.

Assay of Auriferous Tin Stone. C. O. Bannister. Gives the results of a comparison made of five different methods. 1500 w. *Aust Min Stand*—June 20, 1906. No. 78401 B.

Gold Bullion Assaying. A. Douglas. Read at Melbourne, April 4, 1906. A detailed description of the work. 2500 w. *Aust Min Stand*—May 9, 1906. No. 77257 B.

## Assay Values.

Tables for Calculating Assay Values for Gold and Silver in Ores. etc. George T. Holloway. Gives the tables used by the author for some years in calculating assay values, with explanatory notes. 3000 w. *Min Jour*—Jan. 13, 1906. No. 74520 A.

Computation of Assay Values. William Crosley. Read before the Inst. of Min. & Met. Discusses the accuracy of methods of computing values for deposits varying greatly in shape and richness. 2500 w. *Mines & Min*—Feb., 1906. No. 74936 C.

## Australasia.

Gold Mining Industry of Australasia. F. S. Mance. Gives a comparative statement of the yield for 1905 and 1906, with remarks. 900 w. *Eng & Min Jour*—Sept. 1, 1906. No. 78936.

## Australia.

Reduction Plant and Process at the

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## Australia

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## British Columbia

Oroya-Brownhill Mines. Robert Allen. Abstract from *Jour. Cham. Mines*, Kalgoorlie, W. A. Describes the wet crushing process used and the treatment. 2200 w. *Min & Sci Pr*—Nov. 25, 1905. Serial. 1st part. No. 73510.

Occurrence of Albite in the Bendigo Veins. Waldemar Lindgren. Information concerning the discovery of albite with quartz from the gold-bearing veins of Bendigo, tending to confirm the relationship of these deposits to the gold-quartz deposits of California. 200 w. *Ec Geol. Nov.*, 1905. No. 74700 D.

The Indicators of Ballarat. Prof. J. W. Gregory. Describes briefly this interesting goldfield, explaining the indicator line and giving an account of its discovery. Ills. 2200 w. *Min Jour*—Jan. 20, 1906. No. 74743 A.

The South Kalgurli Company's System of Ore Treatment. Arthur C. Claudet. Gives a diagram and description of the ore treatment at the new plant which handles 230 short tons per day. 1200 w. *Eng & Min Jour*—Jan. 20, 1906. No. 74472.

Gold Mining in Western Australia. John Plummer. Brief report with discussion of the cause of a decline in production during the past two years. 800 w. *Min Wld*—Jan. 27, 1906. No. 74781.

Progress of the Gold-Mining Industry of Western Australia. W. Burrell. Brief report of progress during the past year. Ills. 1500 w. *Min Mag*—May. 1906. No. 76903 C.

Great Boulder Proprietary Gold Mine. Robert Allen. Illustrated description of the ore reduction plant and process of reduction. 2700 w. *Min Jour*—June 23, 1906. Serial. 1st part. No. 77786 A.

Kalgoorlie Revisited. Donald Clark. Remarks on the improvements in water supply, labor, methods of treatment, reduction in costs, etc. 3000 w. *Aust Min Stand*—June 6, 1906. No. 77874 B.

Power Generation and Costs at the Great Boulder Perseverance Mine, Western Australia. From the *Monthly Journal of the Chamber of Mines of W. Australia*. Detailed description of the power plant at this gold mine. 2000 w. *Min Rept*—June 28, 1906. No. 77739.

The Associated Gold Mines of W. A. Donald Clark. A summary of recent metallurgical progress in Kalgoorlie. 2000 w. *Aust Min Stand*—May 16, 1906. Serial. 1st part. No. 77467 B.

## Black Hills.

Gold and Tin in the Northwestern Black Hills. Benjamin Sadtler. Report of the gold and tin bearing district in

Crook County, Wyoming, and Lawrence County, South Dakota. The gold veins carry no tin, nor the tin veins any gold, but the placer regions carry both. The geology and development are described. Ills. 3500 w. *Min Wld*—April 28, 1906. No. 76407.

## Black Sands.

Second Preliminary Report on Investigation of Black Sand. Information from the report of Dr. David T. Day concerning the experiments in concentration which have been conducted at the Lewis & Clark Centennial Exposition, with a view of ascertaining the most economical method of separation. 1500 w. *Min Rept*—Dec. 7, 1905. No. 73663.

Treatment of Auriferous Black Sands. Information concerning experiments in Otago and Southland. Also report by Kenneth Ross, on "Some Experiments on the West Coast." 4000 w. *N Z Mines Rec*—Aug. 16, 1906. No. 80123 B.

## Borneo.

The Occurrence of Gold in Upper Sarawak. J. S. Geikie. Read before the Inst. of Min. & Met. An illustrated description of the auriferous deposits occurring in the neighborhood of Bau and Bidi, in upper Sarawak. 3500 w. *Min Jour*—Nov. 18, 1905. Serial. 1st part. No. 73460 A.

## Brazil.

Matto Grosso, Brazil. Armando Brandenburg. Describes this state, and the deposits of gold, and of iron ore. 1200 w. *Eng & Min Jour*—Sept. 1, 1906. No. 78933.

## British Columbia.

Progress of Mining in the Similkameen District. George E. Winkler. Briefly reviews the mining history of this gold and copper region, describing especially the progress during the year 1905. 3000 w. *B. C. Min Rec*—Jan., 1906. Serial. 1st part. No. 75312 B.

Mining and Milling at Ymir. D'Arcy Weatherbe. Describes deposits of gold and silver ore, the method of mining, and the treatment of the ore. 1200 w. *Min & Sci Pr*—March 24, 1906. No. 75848.

The Le Roi, Centre Star, and War Eagle Mines. D'Arcy Weatherbe. Describes these mines in British Columbia and their development. Gold, silver and copper. 2000 w. *Min & Sci Pr*—March 31, 1906. No. 75975.

Windy Arm Mineral Locations. W. F. Robertson. A report of mineral discoveries near the boundary line between British Columbia and Yukon Territory. Astonishingly high assays are reported, running as high as 800 oz. in silver, and

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## California

\$20 in gold to the ton. Map and Ills. 2500 w. Eng & Min Jour—April 14, 1906. No. 76055.

Preliminary Report on the Rossland Mining District. R. W. Brock. A general review of investigations, giving the history, geology, topography, ore deposits, and mineral contents, methods of mining, processes of treatment, etc. copper, gold, silver and other minerals of value. Ills. Also editorial. 16800 w. B C Min Rec—June, 1906. No. 78084 B.

Rossland Mining. Alfred W. Dyer. A report of progress and recent discoveries, and the copper-gold deposits. 1000 w. Can Min Rev—July, 1906. No. 78093 B.

The Eva Mine. Alfred W. Dyer. An illustrated account of a successful gold mine, developed under unfavorable conditions. 1200 w. Can Min Rev—July, 1906. No. 78092 B.

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The Mojave Mining District of California. Charles E. W. Bateson. An illustrated description of the location, climate and vegetation, topography, rocks and their origin, veins and their formation. 4800 w. Am Inst of Min Engrs—Jan, 1906. No. 74715 C.

The Central Mill of the North Star Mines Company. A. D. Foote. Illustrations with description of this fine new stamp mill at Grass Valley, Cal., and a statement concerning some features which have proved undesirable. 1000 w. Min & Sci Pr—April 7, 1906. No. 76060.

Gold Veins in Granite in California. W. H. Storms. Describes the characteristics of these gold-bearing veins. 3200 w. Min & Sci Pr—May 26, 1906. No. 77095.

Gold Mining in Siskiyou County, California. C. Godfrey Gunther. An account of methods applied in old placer fields that have been worked over by the early prospectors. 2000 w. Mines & Min—July, 1906. No. 77907 C.

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The Mining District of Chanarcillo, Chile. Edward Halse. Deals with the distribution and concentration of the silver ores. 800 w. Min Jour—May 5, 1906. Serial. 1st part. No. 76657 A.

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## Clarifying.

Notes on the Use of the Filter Press for Clarifying Solutions. S. J. Truscott and A. Yates. Reports the utilization of

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## Colorado

two Johnson presses with beneficial effect. 700 w. Jour Chem, Met, & Min Soc of S Africa—July, 1906. No. 79118 E.

## Cobalt.

Cobalt Mining District, Ontario. W. O. Hotchkiss. Map, and illustrated account of this rich cobalt-silver district and its development. 3000 w. Min Wld—Dec. 9, 1905. No. 73658.

Cobalt. D'Arcy Weatherbe. Information concerning the silver-nickel-cobalt mine in Ontario, Canada. 2500 w. Min & Sci Pr—March 10, 1906. No. 75563.

The Cobalt-Mining District. Aldrea H. Brown. Information concerning this mining district of Ontario, Canada. Native silver, associated with argentite and various compounds of sulphur, arsenic and antimony, and smaltite, a diarsenide of cobalt, are the most valuable minerals. 1800 w. Min Wld—May 12, 1906. No. 76643.

The Occurrence and Development of the Cobalt Ore Deposits. A. Macdonald. An illustrated account of the geological conditions in the cobalt district in northern Ontario, and the deposits of ores of silver, cobalt, nickel and arsenic. 3500 w. Engineering Magazine—June, 1906. No. 76878 B.

Cobalt. J. A. Macdonald. A report of conditions at these Ontario mines, and a discussion of the outlook. 1500 w. Min & Sci Pr—Oct. 13, 1906. No. 80015.

The Cobalt Mining District. Dr. Robert Bell. From the Summary Report of the Geological Survey Department of Canada for 1905. Describes this district and its ore deposits, giving notes on some of the mines. 7500 w. Can Min Rev—Oct., 1906. No. 80018 B.

## Colombia.

Quartz Mining in Colombia. F. F. Sharpless. An illustrated article describing conditions and methods of mining. 2000 w. Eng & Min Jour—Sept. 15, 1906. No. 79184.

## Colorado.

The Gold Deposits of Plomo, San Luis Park, Colorado. Charles Godfrey Gunther. Gives a general illustrated description of the district, its geology, ore bodies, etc. 3000 w. Ec Geol—Nov, 1905. No. 74598 D.

Mills and Milling Practices at Telluride, Colorado. The bulk of the tonnage mined is a gold and silver bearing quartz and sulphide, adapted for treatment by amalgamation, concentration or cyanidation. Describes the mills, their equip-

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## Comstock

ment and operation. Ills. 2000 w. Min Rept—Sept. 20, 1906. No. 79419.

The Gold Prince Mill. H. J. Baron. Illustrated description of a new 500-ton mill in the San Juan region, Colorado. 1200 w. Min Rept—Aug. 30, 1906. No. 78941.

## Comstock.

The Comstock in 1876. View of Virginia City as it looked thirty years ago, with interesting review of its noted gold and silver mine. 2500 w. Min & Sci Pr—Feb. 24, 1906. No. 75326.

## Concentrates.

The Cyanidation of Concentrates. Bernard Macdonald. A statement of the commercial results, reporting tests made. 1800 w. Eng & Min Jour—Dec. 23, 1905. Serial. 1st part. No. 73995.

## Concentration.

The Baggage Pyritic - Conversion Process. Describes this process which is designed to effect the concentration of any kind of copper, gold, or silver ore. 3500 w. Eng & Min Jour—March 24, 1906. No. 75663.

The Cactus Mill at Newhouse, Utah. Illustrates and describes a modern concentrating plant of one thousand tons daily capacity. 3300 w. Mines & Min—March, 1906. No. 75449 C.

The Tempest-Apex Mill at Ouray, Colorado. Frank McLaughlin. Illustrated description of this concentrating mill, which treats a lead sulphide ore containing gold, silver, copper, lead and zinc. 1000 w. Min Rept—April 26, 1906. No. 76404.

Notes on the Treatment of Hard-Gangued Concentrating Ores. George Huston. Notes resulting from carefully studied practice designed to assist in laying out a flow sheet suitable for hard-gangued ores. 900 w. Min Rept—June 28, 1906. No. 77738.

Concentration of Silver-Lead Ores. V. F. Stanley Low. Gives the power consumption at a new mill in N. S. W. where the heavier parts of the machinery are driven by separate electric motors. Also information in regard to the products and by-products, etc. 2000 w. Eng & Min Jour—Aug. 25, 1906. No. 78817.

Mills and Milling Practices at Creede, Colorado. Describes the four milling plants of the successive wet-crushing concentration system for low-grade gold and silver ores. Ills. 2500 w. Min Rept—Oct. 4, 1906. No. 79651.

## Cost-Accounts.

Cost-Accounts of Gold-Mining Operations. Thomas H. Sheldon. A detailed

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description of the system used by the Portland Gold Mining Co., Cripple Creek, Colo. 6500 w. Am Inst of Min Engrs—Nov., 1905. No. 73964 D.

## Cripple Creek.

Resurvey of Cripple Creek District, Colorado, by the United States Geological Survey. Abstract of report showing new facts determined. 3000 w. Mines & Min—Dec., 1905. No. 73718 C.

The Metallurgy of Cripple Creek, Colorado, Ores. Godfrey D. Doveton. Gives short accounts of the treatment of the various classes of ore. 5400 w. Min Jour—Dec. 23, 1905. No. 74148 A.

## Crushing.

Huntington Mill Notes. Cyril E. Parsons. Information in regard to Huntington Mills in Southern Rhodesia, with a detailed critical description of a single case. Ills. 6800 w. Inst of Min & Met—May 17, 1906. No. 77006 N.

## Cyanide.

Notes on Improvements in the Cyanide Treatment of Sands and Slimes. C. H. Pead. Gives suggestions from the writer's experience. 1400 w. Jour Chem, Met, & Min Soc of S Africa—Sept., 1905. No. 73123 E.

Cyanidation During 1905. Charles H. Fulton. A review of the progress during the year, especially the treatment of slimes, the application to silver ores, and the successful treatment of cupriferous gold and silver ores. 4500 w. Eng & Min Jour—Jan. 13, 1906. No. 74381.

Notes on the Cyanide Process. R. Stuart Browne. An explanation of this process, considering the crushing of the ore, dissolving the gold and silver, precipitation, refining, etc. 5000 w. Min Wld—Dec. 30, 1905. No. 74118.

The Cyanide Process at Guanajuato. Francis J. Hobson. An account of tests made to determine the best method of extraction for these gold and silver ores. 1500 w. Min & Sci Pr—Jan. 6, 1906. No. 74367.

The Importance of Fine-Grinding in the Cyanide-Treatment of Gold- and Silver-Ores. Frederick C. Brown. Calls attention to the importance of fine-grinding in the treatment of comparatively low-grade ores, giving information and results of experiments. 2200 w. Am Inst of Min Engrs—Jan., 1906. No. 74712.

Modern Cyanide Plants. John E. Rothwell. Concerning the improvements recently introduced in the arrangement and operation of cyanide plants. 2000 w. Min Wld—March 24, 1906. No. 75675.

The Cyanide process for Gold and Sil-

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## Cyanide

ver Ores. M. B. Parker. In the *Bul. of the International Miners' Assn.* Discusses its application to ores to which it was formerly considered unsuited. 2400 w. *Mines & Min*—April, 1906. No. 75964 C.

Cyanide Practice at the Liberty Bell Mill, Telluride, Colorado. W. E. Tracy. Illustrates and describes the methods of extraction used for a decomposed quartz ore containing a large amount of clay and talc. 900 w. *Engr & Min Jour*—July 28, 1906. No. 78281.

Mechanical Aids to the Cyanide Process. Illustrates and describes the Garvin machines for agitation and cyanidation of ore pulps, together with electro-deposition of the values from the cyanide solution. 1300 w. *Min Rept*—July 5, 1906. No. 77849.

Cyanide Notes. E. A. H. Tays. Gives facts learned by experience in regard to successful cyaniding. 1400 w. *Min & Sci Pr*—Sept. 1, 1906. No. 79070.

Cyanide Practice with the Moore Filter. R. Gilman Brown. Describes a plant brought to successful operation during 1904-5. 2800 w. *Min & Sci Pr*—Sept. 1, 1906. Serial. 1st part. No. 79068.

Cyaniding in Mexico. J. Leslie Mannell. Reports the extent to which cyanide has been applied in the treatment of gold, silver and copper ores. 1000 w. *Min Wld*—Sept. 15, 1906. No. 79211.

Gold Molecules in Solution. G. T. Beilby. A study of the problems of solution as shown in the practice of the cyanide process of gold extraction. 2500 w. *Sci Am Sup*—Feb. 17, 1906. No. 75030.

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## Deposits.

Metasomatic Processes in the Gold Deposits of Western Australia. Waldemar Lindgren. An explanation of the modes of occurrences of the gold-bearing lodes, and the processes that have transformed the rocks, with other information of interest. 5000 w. *Ec Geol*—June, 1906. No. 78590 D.

## Desert-Mining.

A Southern California Desert Mining. Kirby Thomas. An illustrated account of the exploring and opening up of these desert regions. 2500 w. *Min Wld*—Feb. 3, 1906. No. 74844.

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A Record of an Investigation of Earth Temperatures on the Witwatersrand Gold Fields, and their Relation to Deep Level Mining in the Locality. Hugh F. Mar-

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## Distillation.

The Distillation of Gold (*Sur la Distillation de l'Or*). Henri Moissan. A description of the successful experiments of the author in the volatilisation and distillation of gold and gold alloys in the electric furnace. 2500 w. *Comptes Rendus*—Dec. 11, 1905. No. 74637 D.

## Distribution.

The Geological Distribution of Gold. T. A. Rickard. Read before the Am. Min. Con. Reviews some of the blunders that delayed the discovery of highly productive mining regions, showing that gold occurs in rocks of every age and every kind. 3300 w. *Min Rept*—Oct. 28, 1906. No. 80121.

## Dredger.

The Robinson Gold-Dredger. Illustrates and describes a new gold-dredger of simple design, and its working. 1700 w. *Engng*—May 25, 1906. No. 77141 A.

## Dredging.

Dredging for Gold in the Nome Gold-fields. Otto Halla. A brief account of the successful working of this field. 700 w. *Min & Sci Pr*—Nov. 18, 1905. No. 73474.

Gold Dredging in Colombia. J. P. Hutchins. An account of a recent examination of the deposits on the Magdalena river and its affluents, with conclusions as to dredging probabilities. 3000 w. *Eng & Min Jour*—Dec. 2, 1905. No. 73533.

Gold Dredges. F. F. Coleman. Describes the general character of the dredge, and the work it is to do, illustrating types, and explaining the kind of work for which each is adapted. 2000 w. *Marine Engng*—Jan., 1906. No. 74021 C.

Gold Dredging in 1905. J. P. Hutchins. A review of the progress in this business, the failures and the causes, practice and dredge design, sampling, etc. 3000 w. *Eng & Min Jour*—Jan. 20, 1906. No. 74471.

A New Gold Dredge. George L. Hurst. Illustrated description of a new dredge recently built at El Dorado, on the American River. Dredging is possible to a total depth of 50 ft. 1500 w. *Min & Sci Pr*—Jan. 27, 1906. No. 74847.

The Prospecting and Valuing of Dredging Ground. Norman C. Stines. Describes the prospecting of gravel deposits by means of the Keystone drill, to test their fitness for dredging purposes. Ills. 2000 w. *Min & Sci Pr*—Feb. 3, 1906. Serial. 1st part. No. 74967.

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## Dredging

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## Gold

Economy in Mining with Modern Gold-Dredges. George E. Walsh. Describes the modern gold dredging plant and its working, giving information concerning the cost for the plant, the working costs, etc. Ills. 2000 w. Min Wld—May 19, 1906. No. 76720.

The Bucket-Dredging Industry. E. Seaborn Marks and Gerald N. Marks. Discusses bucket-dredges and their construction, alluvial deposits suited to bucket-dredging, and the requisite conditions for successful operations; dredging operations and costs. Ills. 11000 w. Inst of Min & Met—April 19, 1906. No. 77002 N.

The Bucket-Dredging Industry. E. Seaborn Marks and Gerald N. Marks. Discussion of this paper. 6000 w. Inst of Min & Met—April 19, 1906. No. 77003 N.

Gold Dredging in the Urals, with Notes on Dredging in Siberia. William H. Shockley. An illustrated article giving data of gold-dredging in the Urals, and information regarding the country, labor, etc. 2000 w. Bul Am Inst of Min Engrs—July, 1906. No. 78253.

Gold Dredging by Electric Power. Frank C. Perkins. Illustrates and describes the method used in the west of applying electrical energy to this work. 1200 w. Elec Engr, Lond—Aug. 17, 1906. No. 78839 A.

## Dumps.

A Proposed Method of Treating Sand Residue Dumps. S. J. Truscott and A. Yates. Outlines the proposed scheme of treatment. 1000 w. Jour Chem, Met & Min Soc of S. Africa—Jan., 1906. No. 75596 E.

## Ecuador.

Gold-Dredging in Ecuador. Leonard L. Wetmore. Information concerning the placer fields and something of their history, showing the difference between modern methods of working placers and the crude methods adopted by the Spaniards. Ills. 3000 w. Min Mag—May, 1906. No. 76904 C.

## Egypt.

Gold Mining in Egypt. An illustrated article describing the ancient methods of mining, and reviewing the history of these mines. 2200 w. Min & Sci Pr—Nov. 11, 1905. No. 73233.

Gold Mining in Upper Egypt. Ernest H. S. Simpson. From the Bul. of the Inst. of Min. & Met. Remarks on the results at Atallah, Eridea, and Semna, which give fair prospects of ranking high as producers. 2000 w. Min Jour—April 21, 1906. No. 76445 A.

## Enrichment.

Secondary Enrichment. Sydney Fry. An account of researches at the Britannia gold mine in New Zealand. 1600 w. Aust Min Stand—Dec. 20, 1905. No. 74466 B.

## Extraction

Hydraulic Dredging. F. Danvers Power. Illustrates and describes this method of working alluvial ground, as practiced in Australia, stating its advantages. 1800 w. Eng & Min Jour—April 21, 1906. No. 76265.

Two Electrochemical Processes for the Extraction of Silver and Gold. Describes experiments made by Dr. Mooshegh Vaygouny, with the object of finding a lixiviation process for the extraction of both gold and silver, without any preliminary roasting of the ore. Two independent cyclic processes were developed. 2500 w. Elec-Chem & Met Ind—Aug., 1906. No. 78529 C.

## Feeders.

An Improvement on Swinging Feeders in Stamp Mills. Paul J. Johnson. Gives a sketch and explanatory notes of a scheme for improving the action of such feeders. 500 w. Min Rept—Nov. 23, 1905. No. 73475.

## Filter-Press.

Filter-Press Practice in Western Australia. A. B. Wallace. Illustrates and describes this method of treating gold-bearing slimes. 1200 w. Min & Sci Pr—Feb. 3, 1906. No. 74968.

## Formosa.

The Gold Mines of Formosa. Acting Consul Crowe. An account of the mining since 1890, with information concerning the most important mines. 1200 w. Min Jour—June 2, 1906. No. 77267 A.

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Frozen Gold Gravel. J. P. Hutchins. Illustrated description of phenomena observed in the frozen ground of the far north, and the methods used in breaking and thawing it preparatory to recovering its gold contents, suggesting improvements. 2500 w. Eng & Min Jour—Oct. 20, 1906. No. 79874.

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The Daly-West Mine, Park City, Utah. An illustrated description of this silver-lead mine and the methods of working. 2200 w. Eng & Min Jour—July 7, 1906. No. 778.3.

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Gold and Its Chemistry. G. T. Beilby. Abstract of an address before the S. African meeting of the Brit. Assn. for the Adv. of Science. The influence of iron and of gold upon the

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## Gold Discovery

world's progress is discussed, and the chemical development of metallurgy and its application to gold recovery. 1800 w. *Sci Am Sup*—March 10, 1906. No. 75431.

The Gold in the World and its Extraction (*L'Or dans le Monde et son Extraction*). L. de Launay. A review of the statistics of recent gold production in various parts of the world, with some account of the geology, and of the methods of extraction leading to the present greatly increased production. Two articles. 12000 w. *Rev Gen d Sciences*—June 15, 30, 1906. No. 78184 each D.

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Reported Finding of Gold in the Peace River Country. An illustrated report of a discovery in Canada which promises to be of importance. 4500 w. *B C Min Rec*—Aug., 1906. No. 79491 B.

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New Zealand Gold Dredges. Illustrated description of Watt & Nisbet's dredge-bucket system, and a dredge "Knewstubs" system for the restoration of agricultural lands. 1000 w. *Eng & Min Jour*—April 14, 1906. No. 76056.

## Goldfields.

Talgai and Thane's Creek Goldfields. Lionel C. Ball. Notes on the mines of these fields. 5000 w. *Queens Gov Min Jour*—Oct. 14, 1905. No. 73453 B.

The Northern Goldfields of Colorado. John A. Wolff. Gives the history of this region, describing the deposits, and giving opinion of their great value. 1800 w. *Min Wld*—Dec. 16, 1905. No. 73782.

## Goldfield, Nev.

Deeper Workings of the Goldfield, Nev., Mines. A. G. Hillen. Gives details of the more important properties of this district, showing the richness of the mineral veins in nearly all the deeper workings. 3800 w. *Min Wld*—Jan. 13, 1906. No. 74373.

## Gold Mines.

Gold Mines of the World. Abstracts and extracts from J. H. Curle's book, by Prof. Arthur Lakes. An illustrated review of the principal gold mines and mining regions. 6000 w. *Mines & Min*—Feb. 1906. No. 74932 C.

## Grinding.

Fine Grinding in Metallurgy. E. E. Wann. Aims to open a discussion of the method of extraction by amalgamation and cyanide leaching of gold ores, with a view to improving the treatment of slimes, and constructing a regrinding device superior to those in use. 2000 w. *Min & Sci Pr*—Dec. 16, 1905. No. 74010.

## GOLD AND SILVER

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## Guanajuato.

A Metallurgical Revolution in Guanajuato. Joseph W. Richards. An illustrated article giving extracts from an address by Hon. Dwight Furness, summarizing the present metallurgical situation, and describing the revolution taking place from the patio to the cyanide process for the extraction of gold and silver. 2800 w. *Elec Chem & Met Ind*—Sept., 1906. No. 79200 C.

## Guiana.

Notes on Dutch Guiana. E. H. Teats. Information concerning the geography, mining laws, auriferous deposits, etc. Ills. 3000 w. *Eng & Min Jour*—March 24, 1906. No. 75661.

## Hydraulic Mining.

Hydraulic Mining in a Cold Climate. J. P. Hutchins. A discussion of this method of mining and its problems, especially in relation to its use in the Klondike and other northern places. Ills. 4500 w. *Min & Sci Pr*—June 2, 1906. No. 77211.

A Hydraulic Mine in California. D'Arcy Weatherbe. Illustrated description of the Spring Valley mine, in Butte Co. 1200 w. *Min & Sci Pr*—Sept. 8, 1906. No. 79205.

## Idaho.

The Bullwhacker Mine, near Hailey, Idaho. A. Lakes. Illustrates and describes the geology of this mine and its deposits of lead-silver ore. 1200 w. *Min Rept*—Feb 15, 1906. No. 75046.

The Dollarhide Mine, Idaho. Arthur Lakes. Describes the topography of this region, and the location of the mine. The ore is silver bearing galena, mingled with rosin zinc blende and occasionally a little gray copper. 1600 w. Ills. *Min Wld*—April 7, 1906. No. 75977.

## Japan.

Gold Mining in Japan. A. R. Weigall. Read before the Inst. of Min. & Met. (Abstract). Gives historical, geographical, and geological information, describing the deposits, mining methods, and ore treatment. 3000 w. *Min Jour*—Dec. 30, 1905. Serial. 1st part. No. 74293 A.

## Kalgoorlie.

Crushing and Grinding Practice at Kalgoorlie. Alfred James. An examination of the efficiency of pans, stamps, tube-mills, etc., showing that conditions and the character of the ore determine which is more profitable. 2000 w. *Min & Sci Pr*—July 28, 1906. No. 78431.

Gold Stealing in Kalgoorlie. Ralph Stokes. Discusses the estimate of the



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## Leasing

amount stolen, and the little that is done to prevent such theft. 1200 w. *Min Wld*—Sept. 29, 1906. No. 79569.

## Leasing.

Leasing at Goldfield, Nevada. Claude T. Rice. An account of the ore bodies discovered by leasers and the values recovered. Ills. 2000 w. *Eng & Min Jour*—Sept. 15, 1906. No. 79183.

## Low-Grade Ore.

New Sources of Gold. Waldon Fawcett. An illustrated description of the concentrating machines under trial by the U. S. Government for handling low-grade gold deposits, and for the investigation of the "black sand." 1500 w. *Sci Am*—July 21, 1906. No. 78063.

## Madagascar.

Some Gold Vein Formations of Madagascar. Mr. Dégoutin. Describes the deposits thus far explored, and their peculiarities. 3500 w. *Min Jour*—Sept. 22, 1906. No. 79581 A.

## Mexico.

The Sahuayacan Mining District, Mexico. John C. Treadwell. Gives the location and geology of this district, with information concerning the mines, deposits, etc. Silver, gold, lead, copper, bismuth, antimony, iron and manganese are found, but the principal values are in gold. Ills. 3000 w. *Eng. & Min Jour*—Dec. 30, 1905. No. 74109.

Mining in Western Chihuahua. W. Spencer Hutchinson. An illustrated account of the mines of this region, the gold value being the most important, although silver is also found and other minerals of value. 1200 w. *Eng and Min Jour*—March 3, 1906. No. 75334.

El Oro, the Premier Gold Camp of Mexico. T. Elliott Smith. Description and historical account of this mining region and its development. 4500 w. *Min Wld*—March 31, 1906. No. 75872.

Mining and Metallurgy in El Oro, Mexico. H. E. West. An account of the largest producer of gold in Mexico, and the third largest producer on the continent. Describes the district, deposits, ore treatment, sand treatment, power, etc. Ills. 7000 w. *Min Mag*—May, 1906. No. 76901 C.

The Peregrina Mill, Guanajuato. F. J. Hobson. Gives plan, cross-section, and description of the plant. The entire machinery is to be run with electric motors, the power being brought 103 miles. 800 w. *Eng & Min Jour*—May 19, 1906. No. 76730.

Pachuca. H. E. West. Illustrates and describes this district which is a producer

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of precious metals. 3300 w. *Min & Sci Pr*—May 26, 1906. No. 77094.

The Taviche District, Mexico. Kirby Thomas. Describes the development of this mining camp, about 23 miles south of Oaxaca. Copper, gold and silver are produced. 2300 w. *Min Wld*—June 16, 1906. No. 77352.

The Mining Camps of Sinaloa, Mexico. F. J. H. Merrill. An illustrated account of these mines which yield principally silver, though in some gold predominates. 900 w. *Eng & Min Jour*—Oct. 6, 1906. No. 79663.

The Copete District, Central Sonora. F. J. H. Merrill. Illustrates and describes the La Sultana gold mine, its geology, ore-bodies, and other mines of this district. 700 w. *Eng & Min Jour*—Oct. 6, 1906. No. 79660.

The Sahuaripa District, Sonora, Mexico. C. Nelson Nelson. Describes the mining conditions of these promising gold and copper mines. Ills. 2000 w. *Eng & Min Jour*—Oct. 6, 1906. No. 79661.

## Milling.

Milling Practice at the Dives-Pelican and Seven-Thirty Company's Concentrating Mill, Silver Plume, Colorado. Describes a mill designed to treat ore carrying a small percentage of high grade mineral and requiring fine grinding. 1500 w. *Min Rept*—June 7, 1906. No. 77208.

Milling Plants of Summit County, Colorado. Describes mills for the concentration and separation of zinciferous ores and also of other ores. Ills. 1200 w. *Min Rept*—Sept. 6, 1906. No. 79064.

Present Milling Conditions in the Cripple Creek District, Colorado. G. E. Wolcott. A statement of present conditions not altogether encouraging. 900 w. *Min Rept*—Sept. 6, 1906. No. 79063.

Mills and Milling Practices in the Silverton Camp, San Juan County, Colorado. H. J. Baron. The ores are gold and silver bearing quartz, with other minerals. Illustrates and describes the improved milling methods for low-grade ores. 2500 w. *Min Rept*—Oct. 18, 1906. No. 80023.

## Mine Accounting.

Mine Accounting at Mineville, N. Y. A. E. Hodgkins. An explanation of the methods used. 2200 w. *Eng & Min Jour*—Sept. 22, 1905. No. 79410.

## Mint.

The New Denver Mint. R. L. Whitehead and F. E. Healy. An illustrated description of the equipment and the operative methods. 2500 w. *Mines & Min*—Aug., 1906. Serial 1st part. No. 78485 C.

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## Montana

## GOLD AND SILVER

## Ore Deposits

### Montana.

The Cable Mountain Gold Mining District of Montana. W. D. Bohm. An illustrated historical account of this district, describing the ores, development, etc. 3000 w. *Min Mag*—May, 1906. No. 76902 C.

### Nevada.

South Central Mining Districts of Nevada. A. G. Hillen. A review of the more active operations of the Bullfrog district. 3500 w. *Min Wld*—Dec. 30, 1905. No. 74117.

The Geology and Petrography of the Goldfield Mining District, Nevada. Sketch maps with a description of the geology and topography by John B. Hastings, and of the petrography by Charles P. Berkey. 4500 w. *Bul Am Inst of Min Engrs*—March, 1906. No. 76124 C.

The Southern Klondike District. Esmeralda County, Nevada.—A Study in Metalliferous Quartz Veins of Magmatic Origin. Josiah Edward Spurr. Describes the occurrence in the Southern Klondike camp proper, giving detailed description of rock types, metalliferous veins, general conclusions, etc. 4300 w. *Ec Geol*—Feb., 1906. No. 75844 D.

The Stamp Mill and Cyanide Plant of the Combination Mines Company at Goldfield, Nevada. Mark R. Lamb. Illustrated detailed description of the equipment and working of a mill for the extraction of gold and silver. 1600 w. *Eng & Min Jour*—June 30, 1906. No. 77744.

Goldfield, Nevada. Claude T. Rice. An illustrated account of this camp which has already produced between six and seven million dollars, since its discovery in 1902. 2400 w. *Eng & Min Jour*—Aug. 25, 1906. No. 78813.

The Bullfrog Mining District, Nevada. Claude T. Rice. An illustrated description of this district and its development. It has large veins of a good milling grade of gold ore. 1800 w. *Eng & Min Jour*—Sept. 22, 1906. No. 79411.

### Nevada.

Gold and Silver at Fairview, Nev. Claude T. Rice. Illustrates and describes a new camp discovered this year, and its workings. 1500 w. *Eng & Min Jour*—Oct. 20, 1906. No. 79875.

The Manhattan Mining District, Nevada. Claude T. Rice. Illustrated description with general information of present conditions, the development, ore, etc. 2000 w. *Eng & Min Jour*—Sept. 29, 1906. No. 79549.

### New Mexico.

The Cooney District, New Mexico. Blakely Graham. Reports the geology and mining developments of ores, of gold, silver and copper. 1600 w. *Eng & Min Jour*—Oct. 20, 1906. No. 79876.

### New Mines.

Notes on Southern Nevada and Inyo County, California. H. H. Taft. Information concerning the volcanic area, the Bullfrog mining district, Tonopah, Goldfield, Death Valley, and surrounding regions. 8500 w. *Am Inst of Min Engrs*—Nov., 1905. No. 73963 C.

### New South Wales.

The Mitchell's Creek Gold Mines, New South Wales. Wilfrid F. Macdonald. Gives the history, geology, and development of these mines, mining methods, treatment and costs. Ills. 4000 w. *Inst of Min & Met*—April 19, 1906. No. 77001 N.

Cupriferous Gold-Ores in New South Wales. J. E. Carne. Reports some of the difficulties in working and smelting these ores. 2300 w. *N Z Mines Rec*—May 16, 1906. No. 78398 B.

### New Zealand.

New Zealand's Premier Gold Mine. An account of the Waihi mine and its wonderful progress during the past sixteen years. Ill. 2500 w. *N Z Mines Rec*—Nov. 16, 1905. No. 74124 B.

The First Gold Discoveries in New Zealand. R. A. Loughnan. An interesting account of the early discoveries and mining development. 6000 w. *N Z Mines Rec*—July 16, 1906. Serial. 1st part. No. 78985 B.

### Nova Scotia.

Gold Lodes of Nova Scotia. H. J. Baron. Notes describing the saddle veins and their working, the vertical fissures, and other deposits, and some of the mining properties. Ills. 2500 w. *Min Rept*—Sept. 20, 1906. No. 79418.

### Ontario.

The Cobalt Mining District. W. M. Courtis. Information of interest concerning this district, the richness of the ore, masses of native silver, cobalt, nickel, bismuth, arsenic and a little gold are found. Ills. 1300 w. *Eng & Min Jour*—July 7, 1906. No. 77842.

### Ore Deposits.

The Příbram Ore Deposits (Neues über das Příbramer Erzvorkommen). A. Hofmann. Discussing the recent developments of silver bearing galena in the Příbram mining district of Bohemia. 2000 w. *Oesterr zeitschr f Berg u*

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Hüttenwesen—March 10, 1906. No. 75741 D.

The Ore Deposits of the Ontario Mineral Belt. Walter P. Jenney. Describes the geology of this vein in Utah, and the deposits of silver-lead ore, with other minerals. 4000 w. Min & Sci Pr—Feb. 17, 1906. No. 75254.

## Ore Deposition.

Experiments on the Solution, Transportation and Deposition of Copper, Silver, and Gold. H. N. Stokes. Gives preliminary results of experimental investigations carried out in the laboratory of the U. S. Geol. Survey. 2500 w. Ec Geol—July, 1906. No. 79837 D.

## Ore Reduction.

Description of the Ore Reduction Plant and Process of Reduction on the Oroya-Brownhill Gold Mines. Robert Allen. Describes the character of the ores and gives a sketch plan of the plant. The Diehl process is used. 4000 w. Min Jour—Oct. 28, 1905. No. 73005 A.

The Francke-Tina Process for the Reduction of Silver Ores, as Carried on at Caylloma, Peru. Alfred Fox. Gives a description of the working of this process, which is said to be very expensive. Ills. 2800 w. Inst of Civ Engrs—No. 3571. No. 78024 N.

## Ore Treatment.

Plant for the Handling and Treatment of Ores, at the Silver Cup and Nettie L. Mines, British Columbia. George Attwood. Describes the scheme for the transportation of the ore and extraction of the metals on the spot in a mountainous district where the climate is severe. 5000 w. Ills. (No. 3486.) Inst of Civ Engrs. No. 73177 N.

The South Kalgurli Company's Ore Treatment Plant. Arthur C. Claudet. Describes this new plant which treats 230 short tons per day by dry crushing, roasting, grinding and amalgamating, agitating with cyanide and filter pressing. 1300 w. Min Jour—Dec. 23, 1905. No. 74146 A.

Progress in Gold-Ore Treatment. During 1905. Alfred James. A. review of the main features which have been in the direction of finer crushing and the treatment of slimes. 3200 w. Eng & Min Jour—Jan., 1906. No. 74267.

Milling vs. Smelting in the Treatment of Tonopah-Goldfield Ores. Francis L. Bosqui. Considers that these ores may be more profitably milled than smelted. 1000 w. Min & Sci Pr—March 31, 1906. No. 75973.

The Treatment of Temiskaming Low-Grade Ores. S. F. Kirkpatrick. Reports

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## Placers

three methods of treatment investigated for these silver ores and gives a summary of the results obtained. 1400 w. Can Min Rev—May, 1906. No. 76971 B.

The De Bavay Process. Illustrated description of this process for the treatment of mixed sulphide ore of Broken Hill. 1200 w. Eng & Min Jour—Aug. 25, 1906. No. 78815.

Ore Treatment at the Combination Mine, Goldfield, Nevada. Francis L. Bosqui. An illustrated account of this interesting gold producer and its metallurgical problems. 1600 w. Min & Sci Pr—Oct. 6, 1906. Serial. 1st part. No. 79765.

## Parting.

A New Form of Platinum Parting Apparatus. A. Jarman. Illustrated description of a new form of tray, designed by Prof. Liversidge for use in the Sydney Mint, with comparison with other forms. 1400 w. Inst of Min & Met—May 17, 1906. No. 77007 N.

## Parting Methods.

Electrolytic Versus Sulphuric Parting of Bullion. F. D. Easterbrooks. Abstract of a paper before the Am. Elec.-Chem. Soc., pointing out some of the principal characteristics of the several parting methods. 1600 w. Eng & Min Jour—Dec. 16, 1905. No. 73771.

## Placers.

Deep Placer Deposits of Victoria. H. L. Wilkinson. Discusses the principles which have affected the value of the regularly defined "deep leads." Maps. 2500 w. Eng & Min Jour—Dec. 30, 1905. No. 74108.

Giant Hydraulic Placer Mining in Oregon. A. S. Atkinson. Explains the great difficulties encountered in working high elevations, and describes the pumping of water with turbines against a head of 430 feet for operating giant nozzles. 1700 w. Mines & Min—March, 1906. No. 75454 C.

Mergers in Placer Mining. J. P. Hutchins. Discusses benefits from merging, and the recent merger in dredge-mining operations. Ills. 2300 w. Eng & Min Jour—June 23, 1906. No. 77457.

What Does and What Does Not Constitute a Placer? Arthur Lakes. Discusses the almost universal distribution of alluvial gold, and the legal test to determine what should be classed as placer. 1500 w. Min Rept—Aug. 23, 1906. No. 78825.

Breckenridge, Colorado. James W. Neill. An illustrated description of methods of placer mining. 1500 w. Min & Sci Pr—Sept. 8, 1906. No. 79204.

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Placer Mining in Colombia. F. F. Sharpless. An illustrated article giving information concerning the production in past and present time, and related matters of interest. 2500 w. Eng & Min Jour—Sept. 1, 1906. No. 78937.

Cape Nome Placers. E. B. Wilson. Describes the peculiar occurrence of the gold, and the mining conditions. Ills. 1000 w. Eng & Min Jour—Oct. 13, 1906. No. 79776.

Placers of Santa Fé County, New Mexico. Fayette A. Jones. Briefly reviews the history of this region. 1000 w. Min Wld—Oct. 6, 1906. No. 79648.

Development of Placer Gold Mining in the Klondike District, Canada. J. B. Tyrrel. Abstract of a paper read before the Inst. of Min Engrs. Calls attention to the difficulties encountered, the plans successfully adopted to overcome them, and the constantly reduced cost of mining. The method of steam-thawing is described. 2000 w. Ir & Coal Trds Rev—June 22, 1906. No. 77789 A.

## Pockets.

A Big Pocket. John B. Farish. A brief account of the finding of a big nugget in the Monumental mine, California. 1000 w. Min & Sci Pr—Jan. 13, 1906. No. 74492.

## Precipitates.

The Production of High-Grade Gold Bullion from Zinc-box Precipitates. C. J. Morris. Shows what can be done successfully, on a rather small scale, at a mine struggling to pay its way on a very low-grade ore. 1800 w. Inst of Min & Met—April 19, 1906. No. 75998 N.

## Precipitation.

Electrolytic Precipitation of Gold from Cyanide Solutions. Prof. B. Neumann. A report of experimental investigations and statement of conclusions. 6000 w. Elec-Chem & Met Ind—Aug., 1906. No. 78528 C.

Treatment of the Precipitate and Manipulation of the Tilting Furnaces at the Redjang Lebong Mine, Sumatra. S. J. Truscott. Describes the working of the precipitation plant, giving results and costs. 1500 w. Inst of Min & Met—Oct. 18, 1906. No. 80071 N.

## Production.

Gold and Silver Production of the World. Charles C. Schnatterbeck. A review of the past year showing a phenomenal growth in the gold output, and giving information concerning the United States, and foreign countries. 3500 w. Min Wld—Jan. 27, 1906. No. 74775.

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## Queensland

Increased Production of Gold. R. W. Barrell. Discusses the effect increased production will have on the mining industry, and on the purchasing value of gold. 1800 w. Mines & Min—May, 1806. No. 76512 C.

## Prospecting.

Prospecting Dredging Ground. D'Arcy Weatherbe. Discusses points to be taken into account beside the actual gold content, and the methods of determining them. Ills. 3000 w. Min & Sci Pr—Oct. 20, 1906. No. 80152.

Prospecting a Gold Placer. A description of the machinery used and methods of operating and of calculating values from the results. Ill 3000 w. Mines & Min—July, 1906. No. 77911 C.

A Few Hints to Prospectors. Charles A. Bramble. Suggestions especially for prospecting work in the north of Canada and British America. 2000 w. Can Min Rev—June, 1906. No. 77363 B.

## Prospecting Shaft.

Notes on a Prospecting Shaft in the Goldfield District, Goldfield, Nevada. Edgar A. Collins. Describes the deposits and methods of mining and extraction, showing an unusual production. 1000 w. Inst of Min & Met—April 19, 1906. No. 76999 N.

## Pumping Plant.

Large Pumping Plant at Tasmania Gold Mine. Frank C. Perkins. Illustrated description. 800 w. Mines & Min—Jan., 1906. No. 74251 C.

## Pyrite.

The Relations Between Gold and Pyrite. Henry Lloyd Smyth. Gives a brief account of an occurrence of gold, showing an important distinction to the miner, between the two varieties of pyrite. 1000 w. Min & Sci Pr—July 14, 1906. No. 78200.

## Queensland.

Black Ridge, Clermont. Lionel C. Ball. Recent notes given as a supplementary report to an earlier article. Deals with the geology, mining and milling, claims, &c. Ills. 8500 w. Queens Gov Min Jour—Dec. 15, 1905. Serial. 1st part. No. 74867 B.

Gold Deposits near Mount Ubi, West of the Blackall Range. B. Dunstan. Gives map and description of the auriferous country on Walli and Chinaman's creeks. 1500 w. Queens Gov Min Jour—March 15, 1906. No. 76430 B.

The Norton Goldfield. Lionel C. Ball. Gives the history, location, geology, output, treatment, etc., discussing the future prospects. Ills. 6500 w. Queens Gov

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## Rand

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## Silver Mill

Min Jour—June 15, 1906. Serial. 1st part. No. 78378 B.

### Rand.

Rand Metallurgical Practice and Recent Innovations. G. A. and H. S. Denny. A description of the Meyer & Charlton plant and its working. The object of the plant was to secure the ordinary operations of the decantation system by simple and costless processes depending on gravity. Plates. 40800 w. Jour S African Assn of Engrs—June, 1906. No. 79121 F.

Rand Metallurgical Practice and Recent Innovations. G. A. and H. S. Denny's paper is discussed. 4500 w. Jour S African Assn of Engrs—Aug., 1906. No. 79571 F.

### Reduction.

Ore Reduction at the Sons of Gualia Mine. Robert Allen. Describes the treatment of this gold ore of Australia. The ore is a chloritic schist, with lenses of quartz, calcite and gypsum showing occasionally. It is extremely simple to treat being recovered mainly by battery treatment, followed by cyanide treatment of the sands, and roasting and cyanide treatment of the concentrates. Ills. 4000 w. Min Jour—Feb. 17, 1906. No. 75279 A.

### Refining.

The Manton-Rayfield Refining Process for Gold. H. Knutsen. Describes the working of this process, which claims to refine gold bullion or cyanide-zinc-precipitate with air, oxygen, or acids in the form of vapors or gas. 2000 w. Min Rept—Aug. 16, 1906. No. 78647.

### Reports.

See Industrial Economy.

### Rhodesia.

Four Typical Rhodesian Gold Mines. Theo. F. Van Wagenen. Illustrations, with brief descriptions of the Tebekwe, the Wanderer, the Bonsor, and the Veracity mines. 1000 w. Min & Sci Pr—Nov. 4, 1905. No. 73107.

The Mines of Rhodesia. J. H. Curle, in *The Economist*. An explanation of the condition of the gold mines, leaving the conclusions to the reader. 1200 w. Eng & Min Jour—Nov. 4, 1905. No. 73017.

### Sampling.

Notes on Stope Box Sampling. Wager Bradford. An account of the system of daily stope box sampling as carried out at Langlaate Deep. 3800 w. Jour of Chem, Met, and Min Soc of S Africa—Oct., 1905. No. 73966 E.

The sampling of Base Bullion. John W. Root. Read before the W. Assn. of Tech. Chem. & Met. Briefly considers the

methods in use, and those formerly employed. 1800 w. Min Rept—Feb. 8, 1905. No. 74964.

Note on the Sampling of Gold Alloys. Ernest A. Smith, in *Chemical News*. Information concerning the assaying of various gold alloys used by jewellers and goldsmiths, with tables of assays made. 1700 w. Min Rept—June 14, 1906. No. 77356.

Procedure to be Used in the Sampling and Settling of Ores Shipped to the U. S. Reduction & Refining Co. A copy of the sampling regulations recently issued, with editorial comment. 1600 w. Min Rept—May 31, 1906. No. 77088.

### Sand Sampling.

Sand Sampling in Cyanide Works. Duncan Simpson. States methods employed, with brief discussion of each. 3000 w. Inst of Min & Met—Oct. 18, 1906. No. 80070 N.

### Screening.

Report of Sub-Committee on the Standardization of Battery Screening. 2000 w. Jour Chem, Met, & Min Soc of S Africa (Supplement)—June, 1906. No. 79120 E.

### Separation.

The Separation of Gold in Antimony Ores. F. H. Mason. Gives an analysis showing the nature of the ore treated, and explains experimental investigations made, and the process finally pronounced successful. 3800 w. Min & Sci Pr—April 28, 1906. No. 76638.

### Siberia.

Gold Mining in Western Siberia. L. Tovey. Gives statistics of this industry, the conditions and methods of work, milling, etc. Ills. 2500 w. Eng & Min Jour—Sept. 29, 1906. No. 79548.

### Silver.

Early Silver Production in Mexico and Its Fluctuations. F. J. H. Merrill. Information concerning the production and its variations. 900 w. Eng & Min Jour—Feb. 24, 1906. No. 75258.

### Silver-Cobalt.

The New Silver-Cobalt District of Ontario, Canada. Chauncey E. Butler. An account of the recent remarkable discoveries of cobalt, nickel, and silver ore. 800 w. Min Rept—Nov. 2, 1905. No. 73042.

### Silver-Lead.

Coppabella Mining Field. Joseph E. Crane. A report to the New South Wales Mines Department on this silver-lead field. 3000 w. Aust Min Stand—Dec. 6, 1905. Serial. 1st part. No. 74446 B.

### Silver Mill.

A Wet Silver Mill at a Montana Mine.

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## Slimes

Robert B. Brinsmade. Illustrates and describes the construction of the mill, the machinery used, and method of treating the ore. 5500 w. *Mines & Min*—June, 1906. No. 77187 C.

## Slimes.

The Buss Slimer. A new slime table, invented by Dr. Julius Buss, is illustrated and described. It is intended for treating any ore or tailing between 50-mesh linear and the finest powder that settles in water. 600 w. *Eng & Min Jour*—Dec. 16, 1905. No. 73769.

Slime Treatment at Mount Bobby. John M. Bridge. Read before the Sydney Min. Engng. Soc. Describes the filter press method of treatment. Ills. 1500 w. *Aust Min Stand*—Feb. 28, 1906. Serial. 1st part. No. 76010 B.

The Homestake Slime Plant. H. J. Baron. Describes a plant under construction for the economical cyanidation of gold-carrying slimes by filter pressing. 1400 w. *Min Rept*—June 21, 1906. No. 77462.

The Parrish Continuous Filter. Edward Parrish. Illustrations with description of a design for a continuous slime filter. 700 w. *Eng & Min Jour*—June 2, 1906. No. 77079.

Proposed Process for Treatment of Zinc Gold Slimes before Smelting. Charles E. Meyer. Explains a new process involving a precipitation and resolution in a reagent instead of simple solution by means of an acid. Gives results obtained by experiments. 2500 w. *Jour Chem, Met, & Min Soc of S Africa*—June, 1906. No. 79116 E.

## Sluice.

Sluice Building on Placer. Dennis H. Stovall. Calls attention to important features in the construction of a sluice. Ills. 900 w. *Min Wld*—Nov. 4, 1905. No. 73045.

## Smelting.

The New Smelting. Alfred W. Dyer. An account of the introduction of the Huntington-Heberlein process at Nelson, B. C., and the system employed at the Hall Mines Smelter. Ills. 1600 w. *Can Min Rev*—Oct., 1906. No. 80017 B.

## Smelting Works.

Britannia Smelting Co.'s Smelting Works at Crofton, Vancouver Island, B. C. Illustrated description of the works and their equipment. 2500 w. *B C Min Rec*—Oct., 1905. No. 73255 B.

## Solubility.

The Solubility of Gold in Thiosulphates and Thiocyanates. H. A. White. A report of experiments made to determine

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the cause of the presence of gold in certain mine reservoirs and the enrichment of soil underneath some residue dumps. 1700 w. *Jour of Chem, Met, and Min Soc of S Africa*—Oct., 1905. No. 73967 E.

## Soudan.

Ancient Gold Fields of the Soudan. T. Buxton. Information concerning these old mines and the methods used in working them. 1500 w. *Min Jour*—Feb. 24, 1906. No. 75370 A.

## South Dakota.

The Early History of Black Hills, South Dakota. W. H. Storms. Begins an interesting review of this important gold-mining district. 1800 w. *Min Wld*—Feb. 17, 1906. Serial. 1st part. No. 75048.

## Stamp-Milling.

Stamp-Milling in Northern California. Algernon Del Mar. Describes a series of tests at the Edel mill, discussing the results. Ills. 2200 w. *Min & Sci Pr*—March 3, 1906. No. 75445.

## Stamp Mills.

More Notes on Stamp Mill Practice. Courtenay de Kalb. Read before the Can. Min. Inst. Statements from experience, considering screens, foundations, stamp duty, mortar liners, shoes and dies, etc. 3000 w. *Can Min Rev*—June, 1906. No. 77365 B.

Experiences in Stamp-Mills. Algernon Del Mar. Notes on some mills that proved failures, and some unusual practices. Ills. 1500 w. *Min & Sci Pr*—Aug. 4, 1906. No. 78565.

## Sulphur.

Sulphur in Roasting. William E. Greenawalt. Discusses the elimination of sulphur in roasting ores, and the determination of the sulphur that will give the best results. 1900 w. *Eng & Min Jour*—Dec. 23, 1905. No. 73996.

## Sulphides.

Cerro Gordo. C. H. Laidlaw. Gives history and illustrated description of this California mine. The metals are usually combinations of sulphides and their oxides, carrying gold, silver and copper. 2500 w. *Min Rept*—Feb. 15, 1906. No. 75045.

## Supply.

The Increasing Gold Supply. Editorial on the effect of the increasing supply on the price of materials, cost of labor, and rates of interest. 1000 w. *Mines & Min*—April, 1906. No. 75969 C.

## Tailings.

Tailing Disposal of Gold Dredges. J. P. Hutchins. Reviews the history of tailing disposal and the methods that have

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## Tanks

been tried to restore worked out land to its original condition. Ills. 3800 w. Eng & Min Jour—Feb. 3, 1906. No. 74836.

Treatment of Silver-Lead Tailings by the Cyanide Process. Ernest J. Sweetland. Describes the plant, the character of the ore, the laboratory tests, the working of the plant, etc. 2500 w. Eng & Min Jour—Aug. 25, 1906. No. 78814.

## Tanks.

Iron vs. Wood for Cyanide Leaching Tanks. Francis L. Bosqui. States facts helpful in determining which type is best to use in a given locality. Also reports tests of redwood for the loss of gold by absorption. 900 w. Min & Sci Pr—April 14, 1906. No. 76177.

## Temiskaming.

The Cobalt-Nickel Arsenides & Silver Deposits of Temiskaming. Information from a report by Prof. Willet G. Miller, Provincial Geologist of Ontario. Ills. 2300 w. Can Min Rev—Jan., 1906. No. 74498 B.

The Paragenesis of the Cobalt-Nickel Arsenides and Silver Deposits of Timiskaming. W. Campbell and C. W. Knight. Aims to determine the order in which the minerals which go to make up this ore, in Ontario, have been deposited, and to investigate the relation which the gangue bears to them. Ills. 2500 w. Eng & Min Jour—June 9, 1906. No. 77197.

## Tin-Stone.

The Assay of Auriferous Tin-stone. C. O. Bannister. Read before the Inst. of Min. & Met. Reports results obtained by the author in comparing results obtained by different methods of assaying for gold in alluvial tin deposits. 1500 w. Min Jour—April 21, 1906. No. 76444 A.

## Tonopah.

The Geology of Tonopah. J. E. Spurr. Outline of Professional Paper No. 42, U. S. Geol. Surv. A report of the geology of this region. 1800 w. Eng & Min Jour—Nov. 18, 1905. No. 73240.

Tonopah, Nevada. Claude T. Rice. An illustrated account of present conditions at this important silver mine, with brief description of the geology of the region. 2200 w. Eng & Min Jour—July 21, 1906. Serial. 1st part. No. 78082.

## Transvaal.

Van Ryn Gold Mines Estates, Limited. Address of F. A. Gillam at the annual meeting, reviewing the conditions of these mines in South Africa. Ills. 2700 w. Min Jour—Feb. 3, 1906. No. 74991A.

## GOLD AND SILVER

## Wyoming

The Transvaal. W. Fischer Wilkinson. A report of the mining industry in the Transvaal for 1905, showing increase in production and giving much information. 3700 w. Eng & Min Jour—Jan. 13, 1906. No. 74382.

## Transylvania.

Mining in Transylvania. Ernest Levy. An illustrated article describing the geology and reporting concerning the paying gold mines. 1500 w. Min & Sci Pr—Sept. 1, 1906. No. 79067.

## Tube-Mills.

Tube-Mill Practice. Discussion of W. R. Dowling's paper on this subject. 5000 w. Jour Chem, Met, & Min Soc of S Africa—June, 1906. No. 79117 E.

## Utah.

Structural Features of the Ontario Mineral Belt, Park City, Utah. Walter P. Jenney. Describes this region of great interest to the geologist, and valuable mines of silver-lead ores. 2700 w. Min & Sci Pr—Jan. 6, 1906. No. 74366.

## Veins.

Are the Quartz-Veins of Silver Peak, Nevada, the Result of Magmatic Segregation? John B. Hastings. Gives description of the quartz occurrences of the Silver Peak mines, discussing their origin. 2700 w. Am Inst of Min Engrs—Jan., 1906. No. 74711.

## Victoria.

Charlotte Plains Consolidated. F. D. Johnson. An account of the drainage and final successful working of this deep alluvial gold mine in Victoria. 1500 w. Aust Min Stand—June 27, 1906. No. 78402 B.

Victorian Auriferous Occurrences. Prof. T. S. Hart. An explanation of their mineralogical character. 4500 w. Aust Min Stand—July 25, Aug. 1, 1906. Serial. 2 parts. No. 78988 each B.

## Volatilization Process.

The Application of the Pohle-Croasdale Process. O. H. Fairchild. Describes the new plant at Mayer, Arizona, which is the first attempt on a commercial scale to employ this volatilization process. Ills. 2000 w. Min & Sci Pr—Sept. 1, 1906. No. 79069.

## Wyoming.

Mineral Resources of Northeastern Wyoming. A statement of the mineral resources of Crook County, Wyoming, in the vicinity of Sundance. Gold, copper, silver, lead, coal, gypsum, bentonite, and limestone are found. 2500 w. Min Rept—March 22, 1906. No. 75671.

# MINING AND METALLURGY

## Alloy Steels

### Alloy Steels.

See Mechanical Engineering, materials.

### Australia.

Australian Iron and Iron Ore. John Plummer. Reviews the industry, its development and future outlook. 1500 w. Min Wld—Nov. 4, 1905. No. 73044.

### Basic Process.

The Direct Charging of the Open-Hearth Basic Furnace from the Blast Furnace (Ueber die Verarbeitung Flüssigen Roheisens im Basisch Zugestellten Martinofen). C. Dichmann. A discussion of the practicability of using direct melted charges of raw iron into the basic open-hearth furnace. Serial. Part I. Stahl u Eisen, Dec. 1, 1905. No. 73849 D.

### Bessemer Process.

The Genesis of the Bessemer Process. From Sir Henry Bessemer's recently published autobiography. An account of the writer's researches. Ills. 4500 w. Ir & St Mag—Dec., 1905. No. 74180 D.

Rail Mill Development. Extracts from the address of Robert W. Hunt, before the A. I. M. E. in London, giving an account of the development of the Bessemer process in the United States. 4800 w. Ir Age—Aug. 16, 1906. No. 78564.

The Youngstown Sheet & Tube Company. Illustrated detailed description of the new Bessemer steel plant and finishing mills. 7500 w. Ir Age—Aug. 2, 1906. No. 78334.

### Billet Shears.

Billet Shears for Rolling-Mills. Illustrated descriptions of recent examples of such machines, used in German rolling-mills. 800 w. Engng—Sept. 7, 1906. No. 79233 A.

### Bins.

Coke and Ore Bins. J. W. Pittman. Considers their construction, size, types, etc. General discussion and illustrations. 2800 w. Pro Engrs' Soc of W Penn—June, 1906. No. 77300 D.

### Blast Furnaces.

Some Mexican Charcoal Blast-Furnaces. John Birkinbine. An illustrated article giving information of some of the older plants which depend upon charcoal as fuel. 1400 w. Cassier's Mag—Nov., 1905. No. 72985 B.

The Removal of a Salamander from a Blast Furnace. John J. Smith. An illustrated article. Describes the construction of the furnace, the formation of the salamander, and the operations necessary in removing; also the extent of injury to the furnace. 5300 w. Am Mach—Vol. 29. No. 8. No. 75233.

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## Blast Furnaces

A Graphic Method for the Computation of Blast Furnace Charges. C. O. Bannister. From *Trans. of Inst. of Min. & Met.* Explains the preparation of the diagram and gives an example of the calculation, and of the method of regulating the charge from the analysis of the slag produced. 600 w. Ir & St Mag—March, 1906. No. 75631 D.

Technical Progress in Blast-Furnace Practice (Technische Fortschritte im Hochofenwesen) Oskar Simmersbach. Discussing the briquetting of iron ores, the use of mechanical conveyors and handling apparatus, and the general development of mechanical appliances. Serial, Part I. 3500 w. Stahl u Eisen—March 1, 1906. No. 75743 D.

Dust as a Cause of Wear in Shafts of Blast Furnaces (Gichtstaubs Ursache der Schachtzerstörung in Hochofen). B. Osann. Notes on the corrosive and erosive action of dust upon furnace linings. 1500 w. Stahl u Eisen—March 15, 1906. No. 76228 D.

Interactions Between Iron and Carbon in the Blast Furnace. Discusses experimental investigations of the pressures and temperatures affecting the mutual actions of iron and its oxides with carbon and its oxides. 1000 w. Engng—April 13, 1906. No. 76198 A.

The Determination of the Profiles of Blast Furnaces (Die Berechnung des Hochofenprofils und ihre Grundlegenden Werte). Bernard Osann. A study of the principles governing the shape of the shafts of blast furnaces according to the nature of the ore and method of working. 4000 w. Stahl u Eisen—April 15, 1906. No. 76245 D.

The Use of Oxygen in Removing Furnace Obstructions. C. de Schwarz. Read before the Iron & Steel Inst. Describes the application of compressed oxygen for the opening of closed tap-holes or tuyeres. 2000 w. Ir Age—May 17, 1906. No. 76674.

A Simple Rotary Distributor for Blast Furnace Charges. David Baker. Illustrates and describes a design which may be applied to any form of double-bell charger, retaining the perfect gas-seal. 1000 w. Bul Am Inst of Min Engrs—July, 1906. No. 78249.

The Blast-Furnace Plant of the Federal Furnace Companv. Plans and description of the blast furnace plant and ore storage yard of this company at South Chicago, Ill. 2500 w. Ir Age—July 19, 1906. No. 78012.

The Gas-Producer as an Auxiliary in Iron Blast-Furnace Practice. R. H. Lee. Presents the advantages of a gas-producer



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## Blowholes

driven by forced blast as a means of supplying additional blast when needed. 1600 w. *Bul Am Inst of Min Engrs*—July, 1906. No. 78251 D.

The Heat Balance Sheet of the Blast Furnace. J. W. Richards. A treatment of this subject based on the researches of Sir Lothian Bell, illustrating by problems. 5000 w. *Elec-Chem & Met Ind*—July, 1906. No. 77914 C.

The Northern Iron Company's Blast Furnace. J. H. Granbery. An illustrated description of this furnace plant at Port Henry, N. Y., with a review of its interesting features. 2000 w. *Eng & Min Jour*—July 21, 1906. No. 78081.

The Application of an Acid Hearth to a Blast Furnace (Anwendung von Sauren Böden beim Hochofen). A brief illustrated account of the removal of a basic hearth and replacement with one of acid fire brick. 900 w. *Stahl u Eisen*—Oct. 1, 1906. No. 79943 D.

## Blowholes.

The Formation of Blowholes in Steel Ingots (Ueber die Bildung von Hohlräumen in Stahlblocken). J. Riemer. A discussion of the causes of blowholes and piping in steel ingots, and the defects which follow in forgings and other products. 3000 w. *Stahl u Eisen*—Feb. 15, 1906. No. 75138 D.

## Blowing-Engines.

The Development of Blast-Furnace Blowing-Engines. David E. Roberts. Historical review of the development from the earliest types, with illustrations, and especially the developments of recent times. 2800 w. *Inst of Mech Engrs*—July 30, 1906. No. 78556 D.

## Briquetting.

The Briquetting of Iron Ore and Testing of the Blocks (Die Brikettierung der Eisenerze und die Prüfung der Erzriegel). Dr. H. Wedding. Discussing the various binding substances for uniting the ore into blocks, and the resistance of the briquettes to breaking down in the furnace. Two articles, 5000 w. *Stahl u Eisen*—Jan. 1, 1906. No. 74644 each D.

## Carbon Determination.

Determination of Carbon in Steel by Direct Ignition with Red Lead. Charles Morris Johnson. Gives the writer's experience with this method, with notes on the reasons for its adoption for routine combustion analysis. Ills. 4000 w. *Pro Engr's Soc of W Penn*—Jan., 1906. No. 74544 D.

The Determination of Carbon in Ferrochrome and the Eimer Carbon Crucible. C. Offerhaus. The writer compares some

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## Compressed Steel

direct methods with each other and with Wochler's chlorine method, and gives a short account of his determinations. The Eimer crucible is illustrated and described. 1600 w. *Elec Chem Met Ind*—Feb., 1906. No. 74912 C.

## Cast Iron.

See Mechanical Engineering, Machine Works and Foundries.

See Mechanical Engineering, Materials.

## Cementation.

Notes on Cementation Processes (Einiges über das Zementieren). A. Ledebur. A review of the paper of Guillet before the *Société des Ingenieurs Civils de France* in 1904, discussing the operations of case-hardening by cementation. 2000 w. *Stahl u Eisen*—Jan. 15, 1906. No. 74649 D.

## Census Report.

Census Report on Rolled Iron and Steel. Leading features of this report. 5000 w. *Eng & Min Jour*—Sept. 8, 1906. No. 79062.

## Charging Machines.

Recent Improvements in Combined Ingot Strippers and Vertical Charging Machines. Drawings and description of alterations and improvements introduced. 1600 w. *Ir & Coal Trds Rev*—June 1, 1906. No. 77273 A.

## Classification.

The Classification of Iron by its Molecular Structure (Ueber die Beurteilung des Eisens aus seinem Kleingefüge). Max Kralupper. A study of the effect of heat treatment upon the quality of iron, and the practicability of grading irons by metallographical methods. Serial. Part I. 2500 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—March 31, 1906. No. 76242 D.

## Concentration.

Notes on Some Recent Experiments on the Magnetic Concentration of Iron Sands from the Lower St. Lawrence. John F. Robertson. Deals with attempts to cheaply overcome the low percentage of iron, and the presence of titanium. Ills. 1600 w. *Can Soc of Civ Engrs*—Nov. 30, 1906. (Adv. proof.) No. 74087 C.

## Compressed Steel.

The Harmet Process for Fluid Compressed Steel (Das Pressen Flüssigen Stahles nach dem Harmet Verfahren). Hr. Wicke. An illustrated description of the Harmet process for compressing steel in the ingot for the removal of blowholes and the prevention of piping. Sections of compressed ingots are shown. 2500 w. *Zeitschr d Ver Deutscher Ing*—Aug. 11, 1906. No. 78715 D.

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## Crystallography

Compression of Steel Ingots in the Mould. A. G. Capron. Explains the construction of the ingot moulds and press, stating the advantages obtained by the use of this system. Ills. 1500 w. Ir & St Inst—May, 1906. No. 76914 N.

## Crystallography.

The Crystallography of Iron. F. Osmond and G. Cartaud. Explains the principles of the different methods of investigation used, and describes the experiments and results. Ills. 11000 w. Ir & St Inst—July, 1906. No. 78340 N.

## Desulphurization.

Experimental Desulphurization. Reginald Meeks. Describes experiments made with manganese ore, and considers the use of low sulphur materials, and the use of ferro-manganese in the ladles or in the cupola to be the only positive methods of obtaining low sulphur in castings. 2000 w. Ir Age—Nov. 9, 1905. No. 73053.

## Dry Air Blast.

Dry Air for Blast Furnaces. Abstracts of unpublished papers presented at the Liège Mining and Metallurgical Congress. 3000 w. Ir Age—Nov. 16, 1905. No. 73146.

The Application of Dry-Air Blast to the Manufacture of Iron. Edward de Mille Campbell. A discussion of the paper by James Gayley. Tables and curves showing the influence of variations in the dew-point are given. 3000 w. Am Inst of Min Engrs—Jan., 1906. No. 74713 C.

New Developments in Dry Blast. A Steinbart. Read before the Technische Verein, Pittsburg. Refers to results obtained by Mr. James Gayley, and the theory of Mr. J. E. Johnson, giving also the writer's reason why there is in a dry blast furnace less heat necessary, per pound of iron made, for reactions below the critical temperature. 1800 w. Ir Trd Rev—March 15, 1906. No. 75540.

A Digest of the Criticisms of Gayley's Dry Air Blast Process. F. A. Wilcox. 5600 w. Ir & Coal Trds Rev—May 11, 1906. No. 76924 A.

Notes on the Gayley Dry-Air Blast Process. C. A. Meissner. A further discussion of the paper of James Gayley, with special reference to his supplementary paper, and to the paper of J. E. Johnson, Jr. Also discussion. 14000 w. Bul Am Inst of Min Engrs—May, 1906. No. 77174 D.

The Dry Blast Question (Zur Frage der Windtrocknung). B. Osann. A review of the later results obtained by the use of the Gayley dry-air blast, with

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comments. Serial. Part I. 3000 w. Stahl u Eisen—July 1, 1906. No. 78147 D.

The Gayley Dry Blast Process. Prof. B. Osann. Condensed from *Stahl und Eisen*. Describes a proposed German modification of this process. 4800 w. Ir Age—Sept. 27, 1906. No. 79465.

Different Modes of Blast Refrigeration and Their Power Requirements. J. E. Johnson. Jun. Discusses the cost of the installation required, and the cost of operation of blast refrigerating apparatus, under given conditions, pointing out means whereby the refrigeration may be accomplished with less first cost and less working expense, than were required by Mr. Gayley's installation. 7000 w. Ir & St Inst—July, 1906. No. 78348 N.

## Electric Smelting.

The Development of the Electric Smelting of Iron and Steel (Die Weitere Entwicklung der Elektrischen Verfahren zur Herstellung von Eisen und Stahl). Dr. Albert Neuburger. A review of recent progress with especial reference to the work of Kjellin, Schneider, and Gin. 5000 w. Glaser's Annalen—March 15, 1906. No. 75752 D.

The Kjellin Electric Steel Furnace. E. C. Ibbotson. Gives the latest particulars relating to this process. Ill. 600 w. Ir & St Inst—July, 1906. No. 78351 N.

See Electrical Engineering, Electrochemistry.

## Exposition.

The Iron Industry at the Bavarian National Exposition (Die Eisenindustrie auf der Bayrischen Landesausstellung). With plan of the buildings and a general review of the exhibits related to the iron and steel industries. 3500 w. Stahl u Eisen—Oct. 1, 1906. No. 79941 D.

## Extensions.

Additions to the Illinois Steel Co.'s Plant. Plans and description of a new universal plate mill, and a rail mill, both to be electrically driven. 1500 w. Ir Trd Rev—July 5, 1906. No. 77806.

## Ferro-Manganese.

The Preparation of Carbon. Free Ferro-Manganese. E. G. Ll. Roberts, and E. A. Wraight. Abstract report of research work with ferro-manganese and the efforts made to deprive this alloy of its carbon. 3300 w. Ir & Coal Trds Rev—May 11, 1906. No. 76923 A.

## Furnace Gas.

An Improved Device for Cleaning and Cooling Blast Furnace Gas (Ein Neuer Reinigungs und K hlapparat f r Hochofengase). F. Krull. A description of the Bian apparatus, in which the gas is passed

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## Furnace Hoist

through perforated discs revolving in a closed cylindrical tank containing water. 1200 w. Glückauf—Oct. 28, 1905. No. 73340 D.

## Furnace Hoist.

Electrical Blast Furnace Hoist. Illustrates and describes a plant at work in Germany. 1600 w. Engr, Lond—Nov. 10, 1905. No. 73296 A.

Electric Furnace Hoist. L. Ramakers. An illustrated description of an electrically-operated furnace hoist, which was recently constructed at Frankfurt, Germany. 1200 w. Elec Wld & Engr—Dec. 9, 1905. No. 73669.

## Gas Firing.

The Kurzwernhart Gas-Saving Process. Joseph Hartshorne. Gives the results obtained from this process, together with the objections which have been urged against it, and the answers to them. Ills. 3800 w. Bul Am Inst of Min Engrs—March, 1906. No. 76119.

## Gas Power.

Gas Blowing Engine Plant of the Indiana Steel Co. Illustrated description of machinery similar to that which is to supply the large plant at Gary, Indiana. 2800 w. Ir Trd Rev—July 26, 1906. No. 78260.

## Grinding.

Grit Mills and Pans. Gives results of a series of trials between the grit mill and grinding pans at the Ivanhoe Gold Corporation, Kalgoorlie (W. A.). 2400 w. Aust Min Stand—Oct. 18, 1905. No. 73276 B.

## Handling.

The Handling and Conveying of Furnace Material (Zur Frage der Bewegung und Lagerung von Hüttenrohstoffen). M. Buhle. Describing various forms of dump cars, conveyors, unloaders, especially arranged for handling iron ore, etc. 3500 w. Stahl u Eisen—June 1, 1906. No. 77631 D.

## Heat Treatment.

See Mechanical Engineering, Materials.

## Hematite.

Hematite Mining in New York. Robert B. Brinsmade. Descriptive account of red hematite deposits in St. Lawrence Co., their geology, history, methods of mining, etc. Ills. 3000 w. Eng & Min Jour—Sept. 15, 1906. Serial. 1st part. No. 79186.

Occurrence of Hematite North of Little Current, Georgian Bay. S. Dillon-Mills. Describes the geology of the region, the minerals found, and discusses the chances for making the mining a financial success.

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## Iron Ores

Ills. 2200 w. Can Min Rev—Nov., 1905. No. 73200 B.

## History.

The Early Use of Iron. Bennett H. Brough. Abstract of a lecture delivered before the West of Scotland Ir. & St. Inst. Gives a brief summary of the results of researches which have thrown light on this subject and reviews existing knowledge of the metallurgy of iron and steel before the introduction of the blast furnace. 1500 w. Ir & Coal Trds Rev—March 30, 1906. No. 76021 A.

## India.

Iron and Steel Manufacture in India. An account of conditions relating to iron and steel manufacture in India, and of a proposed plant for an organization to be known as the Tata Iron & Steel Co., Ltd. Ills. 3000 w. Ir Age—July 12, 1906. No. 77903.

## Ingots.

The Manufacture of Steel. Horace Allen. Discusses some important considerations in connection with the casting of ingots. Ills. 1500 w. Mech Engr—Aug. 4, 1906. No. 78544 A.

Piping in Steel Ingots. N. Lilienberg. Considers the processes invented to obviate piping, and gives an illustrated description of the Illingworth casting machine. 2500 w. Bul Am Inst of Min Engrs—May, 1906. No. 77171.

## Iron Industry.

See Industrial Economy.

## Iron Mining.

Iron Mining on a Big Scale. From the *Mining Gazette*, Houghton. Remarks on the indications for a large demand, and the rapid work in progress on the Mesabi and Vermilion ranges. 1800 w. Min & Sci Pr—June, 1906. No. 77361.

## Iron Ores.

Genesis of Lake Superior Iron Ores. Charles Kenneth Leith. A summary of conclusions presented in U. S. Geol. Surv. monographs, with a report of later work and a summary of the general geology of the ores and ore-bearing series. 7500 w. Ec Geol—Oct., 1905. No. 74592 D.

The Hill Iron Ore Properties. Dwight E. Woodbridge. Explains the extent of the Hill holdings, their relations to the Steel Corporation, the advantageous position of the Hill interests and related matters of importance. 3500 w. Ir Age—Jan. 4, 1906. No. 74219.

The Great Deposit of Iron Ore at Parapara, New Zealand. James MacIntosh Bell. An illustrated article describing extensive deposits of hematite ore. 1200 w. Ir Trd Rev—Nov. 23, 1905. No. 73413.

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## Iron Ores

The Northern Iron Fields. M. P. Youngs. Information concerning the ore traffic on the Minnesota railroads, the development work in progress, etc. 2000 w. *Min Wld*—March 3, 1906. No. 75350.

The Ironstone of Mount Lucy, Chillagoe District. B. Dunstan. Geological survey report, describing the deposits in Queensland. Ills. 1000 w. *Queens Gov Min Jour*—March 15, 1906. No. 76429 B.

Iron Ore Reserves. Charles Kenneth Leith. Discusses estimates that have been made of the world's supply of iron ore, its rate of depletion, etc. 2800 w. *Ec Geol*—Feb., 1906. No. 75843 D.

Origin and Occurrence of Certain Iron Ores of North-Eastern Kentucky. W. C. Phalen. Describes these deposits and presents hypotheses to account for them. 4700 w. *Ec Geol*—July, 1906. No. 79839 D.

The Iron Ore Supplies of the Asturias. Map, with description of deposits and their location, development, etc., so far as explored. 5400 w. *Ir & Coal Trds Rev*—Sept. 28, 1906. No. 79709 A.

Iron Ores Reserves. Charles Kenneth Leith. Showing that current estimates point to a short life for iron ore reserves, but that these estimates are low, and that low grade ore is not sufficiently considered. 2800 w. *Can Min Rev*—June, 1906. No. 77364 B.

Mining Soft Iron Ore Without Timber. Stuart Rhett Elliott. Describes a method of mining applicable to a variety of ore that drills easily, breaks and runs freely, yet is hard enough to stand for a considerable time over a large opening. 1200 w. *Min & Sci Pr*—June 9, 1906. No. 77358.

## Iron Trade.

See Industrial Economy.

## Iron Works.

The Lothringer Iron Works at Kneuttingen (Die Werke des Lotringer Hüttenvereins in Kneuttingen). Bernhard Osann. A detailed description of the furnaces and rolling mills of a new large works in Belgian Lorraine. 4500 w. Three plates. *Stahl u Eisen*—Nov. 15, 1905. No. 73847 D.

The Lowmoor Iron Works. An illustrated article giving particulars regarding these works. 5000 w. *Ir & Coal Trds Rev*—Aug. 24, 1906. No. 79022 A.

The Minnequa Works of the Colorado Fuel and Iron Company. Lawrence Lewis. Illustrated descriptions of the blast-furnaces and other departments of these extensive works at Pueblo, Colo-

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## Mexico

rado. 2400 w. *Sci Am*—Sept. 22, 1906. No. 79291.

## Magnetite.

Magnetite Deposits and Mining at Mineville, N. Y. J. H. Granbery. An illustrated series of articles on the nature and origin of these deposits near Lake Champlain. 2200 w. *Eng & Min Jour*—May 12, 1906. Serial. 1st part. No. 76603.

## Manganese.

Preliminary Note on the Influence of Manganese on Iron. J. O. Arnold and F. K. Knowles. Reports tests made by a number of investigators, giving the composition of the alloys, and explains the method of preparing alloys of nearly pure iron and manganese. 1500 w. *Ir & St Inst*—May, 1906. No. 76916 N.

Manganese in Iron and Steel. A. A. Read. A comparison of some methods for the determination of manganese in iron and steel. 900 w. *Engng*—Oct. 27, 1905. No. 73008 A.

Manganese, It's Prices and Uses. Dr. J. Ohly. Gives a copy of the last report issued by the Carnegie Co. in regard to this product, and discusses the changes of importance. 1200 w. *Min Wld*—Jan. 13, 1906. No. 74372.

Meeting the Insufficient Supply of Manganiferous Ores (Die Deckung des Bedarfs an Manganerzen). Wilhelm Venator. A review of the sources of manganiferous ores in various parts of the world, and the extent to which the demand for steel manufacture can be met. Serial. Part I. 3000 w. *Stahl u Eisen*—Jan. 15, 1906. No. 74648 D.

The Manganese Industry in India. Ralph Stokes. Illustrated article giving information of this industry, the deposits, working, etc. 1400 w. *Min Wld*—June 16, 1906. No. 77351.

## Mesaba.

The Western Mesaba Iron Range. Dwight E. Woodbridge. Map and information concerning the mineral wealth of township 56, range 24. 1500 w. *Ir Age*—Feb. 1, 1906. No. 74788.

## Metallography.

The Metallography of Iron in England. (Die Metallographie des Eisens in England). Dr. H. Wedding. A review of the work which has been done by British metallurgists and metallographists, with reproductions of microphotographs showing the different physical constituents of iron alloys. 3500 w. *Stahl u Eisen*—April 15, 1906. No. 76247 D.

## Mexico.

Iron Manufacture in Mexico. John

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## Michipicoten

**Birkinbine.** Describes the topography of Mexico and the bearing on iron and steel manufacture, and gives information concerning the industry. The conditions are considered encouraging. 2200 w. *Ir & St Mag*—Jan., 1906. No. 74535 D.

## Michipicoten.

**The Helen Iron Mine, Michipicoten.** Arthur P. Coleman. Describes this mine in Ontario, its topography, geology, ore body, origin of the ore, etc. Map and sections. 2000 w. *Ec Geol*—June, 1906. No. 78589 D.

## Mine.

**The Forest of Dean Iron Mine.** An account of a historic property in Orange Co., N. Y., with illustrated description of the new equipment and work of reopening the mine. 2000 w. *Ir Age*—June 21, 1906. No. 77405.

## Mixers.

**Heated Mixers for Pig Iron** (Ueber Heizbare Roheisenmischer). O. Simmersbach. With illustrations of several designs of oscillating mixers, so arranged that the contents can be heated during the operation. 3000 w. *Stahl u Eisen*—Oct. 15, 1906. No. 79945 D.

## Nodulising.

**The Nodulising and Desulphurisation of Fine Iron Ores and Pyrites Cinder.** Albert Ladd Colby. Gives a description of the plants using this patented process and also the process. Ills. 3500 w. *Ir & St Inst*—July, 1906. No. 78342 N.

## Ontario.

**Iron Ore in Ontario.** Phillips Thompson. Notes from reports dealing with different areas where iron ore is known to occur, describing the deposits. 1800 w. *Eng & Min Jour*—April 14, 1906. No. 76057.

## Open Hearth.

**The Bertrand-Thiel Open Hearth Steel Process** (Le Procédé Bertrand-Thiel pour la Fabrication de l'Acier sur Sole). A general account of the double-furnace process, with details of the practical results at Kladno. 2500 w. *Génie Civil*—Nov. 4, 1905. No. 73317 D.

**The Manufacture of Steel in Open-Hearth Furnaces.** Horace Allen. Describes the principal parts of the apparatus, and briefly considers several processes for the production of steel. Ills. 1000 w. *Mech Engr*—Sept. 1, 1906. No. 79123 A.

**The Chemical Action of the Acid Open-Hearth Furnace** (Action Chimique du Four Martin Acide). M. Deslandes. Examining successively the behavior of the silicon, manganese, sulphur, phosphorus, and nickel, as observed in fur-

## IRON AND STEEL

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naces at the Schneider works. 3500 w. *Revue de Métallurgie*—June, 1906. No. 77669 H.

**The Influence of Silicon and Graphite on the Open-Hearth Process.** Alex. S. Thomas. Discusses the effect of a high percentage of silicon in the iron, and of a high percentage of graphite, and points in the successful working of the metal. 2500 w. *Ir & St Inst*—July, 1906. No. 78350 N.

## Ore Deposits.

**The Iron Ore Deposits of the World** (Die Eisenerzvorräte der Welt). A statistical review, giving brief tables of the principal deposits of iron ore in Europe and America. 2000 w. *Glückauf*—Dec. 9, 1905. No. 73844 D.

**The Menominee Range.** John L. Buell. Abstract of a paper read before the Lake Superior Min. Inst. Gives some reasons why the discovery of these iron ore deposits were belated, an account of the discovery, and theories of the formation. 1500 w. *Ir Age*—Dec. 7, 1905. No. 73581.

**The Origin of Clinton Red Fossil-Ore in Lookout Mountain, Alabama.** William M. Bowron. Gives the theory advanced to explain these deposits, personal investigations, a statement of the geological conditions, conclusions, &c. Ills. 6500 w. *Am Inst of Min Engrs*—Nov., 1905. No. 73961.

## Ore Supply.

**The Iron Ore Supply of the World.** Interesting data from reports of Prof. Törnebohm to the Swedish Parliament, and of other reports by experts. Map. 2500 w. *Ir Age*—Nov. 2, 1905. No. 72936.

## Overstrain.

**Effect of Low Temperature on the Recovery of Steel from Overstrain.** E. J. McCaustland. Supplementary diagrammatic charts, showing the results of the heat-treatment of Specimens Nos. 1 to 12 to accompany a paper published in the May Bulletin, 1906. *Bul Am Inst of Min Engrs*—July, 1906. No. 78254.

## Phosphoric Irons.

**On the Manufacture of a High-Class Steel from Phosphoric Irons.** William Galbraith. Discusses the possibility of making a high-class steel from these ores by some modification of the basic process. 1300 w. *Ir & Coal Trds Rev*—March 23, 1906. No. 75914 A.

## Pig Iron.

See Industrial Economy.

See Mechanical Engineering, Materials.

## Plate Mills.

The Central Iron and Steel Company's

## MINING AND METALLURGY

### Puddling

Plate Mills at Harrisburg, Pa. Reviews the history of these works and gives an illustrated detailed description. 4000 w. *Ir Age*—Jan. 4, 1906. No. 74222.

### Puddling.

The Development of the Roe Puddling Process. James P. Roe. Gives a brief description of the ordinary puddling process, and some of the puddlers invented, and a detailed account of the development of the Roe process. Ills. 10000 w. *Ir & St Inst*—July, 1906. No. 78341 N.

### Rail Mill.

The Republic Iron and Steel Company's Rail Mill. Illustrated description of a mill at Youngstown, Ohio, where conditions compelled unusual engineering skill. 1500 w. *Ir Age*—Nov. 9, 1905. No. 73052.

Plant of the Algoma Steel Co., Sault Ste. Marie. Illustrates and describes one of the most modern steel plants in Canada. The principal production is steel rails. 3500 w. *Ir Trd Rev*—Dec. 21, 1905. No. 73974.

New Rail Mill of Dominion Iron and Steel Company, Limited, Sydney, Cape Breton. An illustrated description of a modern installation. 2500 w. *Can Engr*—Feb, 1906. No. 74840.

### Re-Rolling.

The Works of the English McKenna Process Company. Describing the new plant at Birkenhead for re-rolling old and worn rails; including grinding machinery, heating furnaces, rolling mills, and general mechanical equipment. 3000 w. *Engn'g*—March 2, 1906. Serial, Part I. No. 75506 A.

### Rolling.

Improvements in Rolling Iron and Steel. James E. York. Explains the difficulties met in roll-designing, and gives an illustrated detailed description of the York universal mill, for rolling sections with wide flanges and their webs, or the usual sections, explaining its advantages. Also considers the making of steel ties. 4000 w. *Bul Am Inst of Min Engrs*—May, 1906. No. 77172 C.

Improvements in Rolling Iron and Steel. James E. York. Read at joint meeting of the *Ir. & St. Inst.* and *Am. Inst. of Min. Engrs.*, London. Explains the difficulties which led to the designing of the York universal mill, describing the mill and discussing its advantages. 4000 w. *Ir Age*—July 26, 1906. No. 78227.

### Rolling Mills.

New Types of Rolling Mill Gearing. Abstract of a paper by Director Ortman

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before a meeting of the Assn. of Ironmasters in South-West Germany and Luxemburg. Illustrates and describes types of gearing, and discusses the cost of motive power. 2500 w. *Ir & Coal Trds Rev*—Feb. 9, 1906. No. 75223 A.

Some Notes on Modern German Rolling Mills. Illustrates and describes types of modern mills used in Germany and their working and arrangement. 3000 w. *Ir & Coal Trds Rev*—Jan. 26, 1906. Serial, 1st part. No. 74881A.

The Electric Driving of Rolling-Mill Trains (*Elektrischer Antrieb von Reversierwalzenstrassen*). F. Weideneder. A comparison of the driving of rolling mills by electric motors with the use of steam engines, using the exhaust steam to operate low-pressure steam turbines. 1800 w. *Stahl u Eisen*—Feb. 1, 1906. No. 75135 D.

### Methods of Driving Rolling Mills.

A comparison of the effectiveness of steam power and electric motors for driving rolling mills, advocating electric driving, with gas engines as prime movers. Abstract from paper by H. Ortman in *Stahl und Eisen*. 2800 w. *Ir Age*—March 8, 1906. No. 75424.

The Large Wire-Rod Rolling Mills of The Phoenix Works at Hamm, Westphalia (*Die Grosse Drahtstrasse der A. G. Phoenix zu Hamm i. w.*) with plan of the mill, and illustrated description of the triple-expansion engines of 2000 h. p. 2000 w. 2 plates. *Stahl u Eisen*—March 1, 1906. No. 76742 D.

Jones & Laughlin New No. 14 Structural Mill. Description, fully illustrated, of the largest rolling mill in the world, and an account of its rapid construction at Pittsburg. 2000 w. *Ir Trd Rev*—April 26, 1906. No. 76331.

Rolling Mill Drive Construction. Illustrations of old and new designs of pinions, spindles, couplings, etc., reproduced from an article by H. Ortman in *Stahl und Eisen*. 1700 w. *Ir Age*—April 12, 1906. No. 76022 A.

The Design of Rolling Mills. W. H. A. Robertson. Calls attention to points needing improvement. 1000 w. *Ir & Coal Trds Rev*—April 20, 1906. No. 76459 A.

The Jones & Laughlin Steel Company's New Structural Mill. Illustrated detailed description of a new mill recently completed at Pittsburg. 2000 w. *Ir Age*—July 5, 1906. No. 77770.

Effect of Roll Passes in Metal. A. W. Heinle. Discusses the effect of the mechanical action of rolls. 900 w. *Ind Wld*—Aug. 18, 1906. No. 78617.

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## Rolling Mills

The Electric Driving of Rolling Mills. (Der Elektrische Antrieb der Walzenstrassen). F. Janssen. Data of practical results in running a three-high rolling mill with electric motors, showing the advantage of the capacity to sustain a brief heavy overload. 1500 w. Stahl u Eisen—July 15, 1906. No. 78731 D.

The Forces and Moments in Rolling Mills (Die beim Walzvorgange Auftretenden Kräfte und Momente). P. Fröhlich. An examination of the direction and magnitude of stresses on rolls and housings, for use in designing rolling mills. 2000 w. Stahl u Eisen—Aug. 1, 1906. No. 78733 D.

The Roll Motors of an Electrically Operated Rail Mill. B. Wiley. Illustrated description of the first rolling mill entirely equipped with electric motors. Describes the operation of the mill and states the points of advantage. Ills. 2200 w. Elec Jour—Aug., 1906. No. 78601.

An Improved Process for Rolling Round Iron (Neues Verfahren zum Walzen von Rundeisen aus Führung). W. Gafel. The rolls are arranged alternately horizontal and vertical, in order to make a truer product. 3500 w. Stahl u Eisen—Oct. 15, 1906. No. 79946 D.

See Mechanical Engineering, Machine Works and Foundries.

## Russia.

The Reconstruction of a Blast Furnace in Southern Russia (Modernes Umbau eines Hochofens in Sudrussland). Paul Thomas. With illustrations showing the workings at Kramatorskaia in the Government of Kharkoff, with details of the old and new furnaces. 2000 w. 1 plate. Stahl u Eisen—May 15, 1906. No. 76813 D.

A New Iron works in Russia (Ein Neues Russisches Hochofenwerk). Ferd. Heck. A review, with tables and diagrams, of the iron production of Russia, with especial reference to the development of the Tscherdinsk district, in the Government of Perm, between the Unja and Perwokamennoi rivers. 3000 w. Stahl u Eisen—Feb. 15, 1906. No. 75139 D.

## Sampling.

Cargo Sampling of Iron Ores at Lake Erie Ports. W. J. Battle & Son. Read at meeting of the L. Sup. Min. Inst. Explains how samples are taken, advocating large samples, and giving the methods of analysis used. 2500 w. Ir Age—Nov. 2, 1905. No. 72937.

Cargo Sampling of Iron Ore at Erie Ports. John C. Powers. A criticism of

## IRON AND STEEL

## Smelting

the methods employed, and of the dishonesty overlooked, showing its importance and the remedy. 1000 w. Ir Trd Rev—Aug. 16, 1906. No. 78576.

## Segregation.

Segregation in Steel Ingots. Charles L. Huston. Read at meeting of the Am. Soc. of Test. Mat. Presents the results of tensile tests and carbon analyses from plates, showing how the steel varies throughout the different parts of the ingots. Ills. 2500 w. Ir Age—July 5, 1906. No. 77769.

Segregation in Steel Ingots. J. E. Stead. Read before the British Assn. for the Adv. of Science. Gives a summary of conclusions from experimental researches, considering the effects on the mechanical properties of steel. 3000 w. Ir Age—Oct. 18, 1906. No. 79824.

Variations in Strength of Rolled Steel Plates Due to Segregation of Carbon. A review of a recent paper by Charles L. Huston on "Experiments on the Segregation of Steel Ingots in Its Relation to Plate Specifications." Ills. 2500 w. Eng News—July 26, 1906. No. 78232.

## Separation.

The Wet Separation of Iron Ores. Walter J. May. Suggestions for the cleaning of low grade ores. 1000 w. Prac Engr—Sept. 7, 1906. No. 79227 A.

## Separators.

Magnetic Separators (Les Séparateurs Magnétiques). L. Fabre. Illustrated description of various types of machines for separating magnetic ores from rock, sand, and other impurities. Two articles. 3000 w. L'Electricien—Feb. 17, 24, 1906. No. 75766 Each B.

## Silicon.

The Microstructure of Silicon and Alloys Containing Silicon. A. B. Albro. An illustrated report of investigations made under the direction of Henry Noel Potter. 1800 w. Elec, Chem & Met Ind—Nov., 1905. Serial. 1st part. No. 73072 C.

## Smelting.

Official Preliminary Report of the Dominion Government, on the Experiments Made at Sault Ste. Marie, in the Smelting of Canadian Iron Ores by the Electro-thermic Process. Describes the furnace and electric holder, electrical machinery, experiments, etc., giving a summary of the results. 5000 w. Can Engr—June, 1906. No. 77191.

An Iron Smelters' Village in India. C. M. Weld. Describes a type of present day Indian iron smelting. Ills. 2500 w. Ir Age—Sept. 13, 1906. No. 79153.

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## Spanish Mines

The Blast Furnace and Open Hearth Furnace Combined. Horace Allen. Discusses the present methods of smelting iron and their cost, and illustrates a combined shaft furnace and open hearth furnace as a possible means of securing economy. 900 w. *Mech Engr*—Sept. 29, 1906. No. 79682 A.

## Spanish Mines.

The Alquife Iron-Ore Mines, in the South of Spain. George Harley Bulmer. Describes these mines and their working. 1000 w. (No. 3496.) *Inst of Civ Engrs*. No. 73164 N.

The Iron Ore Deposits of Spain (Der Eisenerzreichtum Spaniens). Oskar Simmersbach. A review of the valuable iron ore beds of Spain, with chemical analyses, and tabulated data concerning exports. 3500 w. *Glückauf*—Nov. 4, 1905. No. 73341 D.

## Spiegeleisen.

An Old Specimen of American Spiegeleisen. Frank Firmstone. Description and analysis of a piece of spiegeleisen, supposed to have been made at the old charcoal furnace which once stood at the village of Andover, N. J. 1000 w. *Am Inst of Min Engrs*—Jan., 1906. No. 74709.

## Steel.

Annealing and Crystallization of Steel. Jas. H. Baker. An illustrated article dealing with steel for hard service. 1000 w. *Ir Age*—Oct. 4, 1906. No. 79609.

Methods of Producing Steel (Die Herstellungsarten des Stahles). W. Schmiedhammer. A review of the various modern steel processes and their commercial applications. Two articles. 3000 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—Sept. 22, 29, 1906. No. 79934 each D.

The Use of Vanadium in Steel Manufacture. B. E. D. Stafford. Read before the Am. Boiler Mfrs. Assn. Gives information concerning results obtained by the use of vanadium, especially its influence in increasing the elastic limit. 1800 w. *Am Mech*—Vol. 29. No. 41. No. 79768.

The Varieties of Steel and the Physical and Chemical Conditions in Hardening (Die Stahlsorten und die Physikalischen und Chemischen Vorgänge beim Harten). Karl Poech. A tabulated presentation of the different kinds of steel, with especial reference to German products; together with micro-photographs showing various carbon contents. 3500 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—July 14, 1906. No. 78737 D.

Uses of Steel Versus Wrought Iron. Thomas Lace. Favors the use of open-hearth steel and calls attention to the

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## Sulphur

short-comings of wrought iron. 2500 w. *Am Mfr*—April 15, 1906. No. 75940.

Crucible Steel. R. Barranger. Explains the manufacture of crucible steel, giving illustrated description of furnaces used, and information concerning the production. 4000 w. *Foundry*—May, 1906. No. 76710.

The Effect of Copper in Steel. F. H. Wigham. A report of research work, resulting in the conclusion that copper to the extent of 0.25 per cent is no disadvantage in the manufacture of the best classes of steel wire. 2000 w. *Ir & St Inst*—May, 1906. No. 76912 N.

See also *Mechanical Engineering, Materials*.

## Steel Plant.

U. S. Steel Corporation's Great Plant at Gary, Ind. Diagram and description of a plant under construction at the extreme southern end of Lake Michigan. 3000 w. *Ir Trd Rev*—June 21, 1906. No. 77399.

## Steel Plates.

Manufacture of Steel Plates. G. M. Kohler. The present article considers the production of the ingots, the molds, casting, stripping, reheating, &c. Ills. 2200 w. *Boiler Maker*—Jan., 1906. Serial. 1st part. No. 74161.

## Steel Sheets.

Brittleness and Blisters in Thin Steel Sheets. Edward F. Law. Reports an investigation of the causes, giving the conclusions from the results. Ills. 1800 w. *Ir. & St Inst*—May, 1906. No. 76913 N.

See also *Mechanical Engineering, Materials*.

## Steel vs. Iron.

Uses of Steel versus Wrought Iron. Thomas Lace. Defines steel, and describes the characteristics of cast and wrought iron, the old methods of manufacture, and the modern processes, the uses of these materials, etc. General discussion. 9900 w. *Ry Club of Pittsburgh*—March 23, 1906. No. 78594 C.

See also *Mechanical Engineering, Materials*.

## Steel Works.

German Steel Works and Rolling Mills. Henry Crowe. Abstract of a paper read before the Cleveland Inst. of Engrs. Short descriptions of various works visited. 2500 w. *Ir & Coal Trds Rev*—April 13, 1906. Serial. 1st part. No. 76310 A.

See also *Mechanical Engineering, Materials*.

## Sulphur.

The Determination of Sulphur in Iron



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## Talbot Process

(Zur Bestimmung des Schwefels im Eisen). Wilhelm Schulte. A review of the practice of various iron-works laboratories, with notes and apparatus illustrating the author's methods. 4000 w. Stahl u Eisen—Aug. 15, 1906. No. 79-368 D.

## Talbot Process.

The Talbot Continuous Steel Process and its Benefits in Steel-making. G. A.

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## Blasting

Wilson. Describes the working of this process at the Cargo Fleet works, of Mid-dlesbrough. 2500 w. Ir & Coal Trds Rev—Feb. 16, 1906. No. 75292 A.

## Vermillion.

The Steel Corporation's Vermillion Mines. A report of the progress of these valuable iron mines in the Lake Superior district. 1500 w. Ir Age—Sept. 13, 1906. No. 79155.

## MINING

### Accidents.

Fatal Accidents in Coal Mining in 1904. Frederick L. Hoffman. A report of the facts with comment on the causes and conditions. 3500 w. Eng & Min Jour—Dec. 2, 1905. No. 73535.

Safety Measures in Mining. Donald Macaulay and Louis G. Irvine. The present paper discusses measures in cases of ordinary accidents, and measures in cases of gassing. 7000 w. Jour Chem, Met & Min Soc of S Africa—Nov., 1905. No. 74399 E.

Catastrophes and Accidents in Mines (Les Catastrophes et Accidents de Mines). H. Schmerber. A study of causes of the various kinds of disasters in mining operations, with possible warnings and methods of fighting them; with especial reference to the disaster at the Courrières colliery. 3500 w. Génie Civil—March 31, 1906. No. 76218 D.

### Agriculture.

The Relations of Mining and Metallurgy to Agriculture. F. W. Traphagen. Abstract of a paper read before the West. Assn. of Tech., Chem & Met. Discusses cases of damage caused by mills and smelters to crops and farm animals, with special reference to conditions in Montana. 2500 w. Min Jour—Jan. 6, 1906. No. 74409 A.

### Air Blasts.

Stresses in the Country-Rock as the Cause of Air Blasts in the Mines at Příbram, Bohemia. Hugo Stefan. Describes conditions in these mines which seem to justify the conclusion that the cause of explosions is due to pressure and stresses, and considers the preventive measures employed. 2500 w. Sch of Mines Qr—July, 1906. No. 79263 D.

### Alaska.

Progress of Investigation of Mineral Resources of Alaska in 1905. Alfred Brooks. Abstract from Bul. of U. S. G. S. Interesting review of the mining industry, the output, the improved condi-

tions, commercial advancement, etc. 2200 w. Min Rept—Oct. 11, 1906. No. 79782.

Present Conditions in Southern Alaskan Mining Districts. Wm. M. Brewer. A fully illustrated review of mining work in Southern Alaska, discussing especially gold and copper production and prospects. 4000 w. Engineering Magazine—Feb., 1906. No. 74673 B.

Alaska. Alfred H. Brooks. Presented at the El Paso meeting of the Am. Min. Cong. The mineral production of the past year shows a remarkable increase over 1904. Ills. 3000 w. Min. Wld—Jan. 27, 1906. No. 74783.

### Assessment Work.

Performance of Assessment Work on Mines. Concerning work done on a mining claim in compliance with U. S. statutes. 700 w. Min Rept—Aug. 23, 1906. Serial. 1st part. No. 78827.

### Australia.

Eastern States of Australia. F. S. Mance. A review of a most satisfactory year, giving statements in regard to gold, silver, copper, tin, coal, and other minerals. 2200 w. Eng & Min Jour—Jan., 1906. No. 74264.

### Blasting.

An Improved Form of Electric Exploder for Blasting. J. Schuermann. Gives an illustrated detailed description of the ordinary electric exploder, and also of the improved type explaining its advantage. 1000 w. Eng News—Jan 25, 1906. No. 74563.

Detonating Caps for Blasting. Roland L. Oliver. A practical discussion of the principles of the detonation of powder; how blasting caps should be used to secure the most economical results, and the importance of their function. Ills. 5000 w. Eng & Min Jour—Oct. 13, 1906. No. 79777.

Arrangement for Electric Spitting of Fuses in Shaft Blasting. J. A. Clay. Illustrates and describes an arrangement for

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## Bore Holes

igniting the fuses by electricity, to secure greater safety in shaft-sinking. 600 w. *Min Rept*—Feb. 15, 1906. No. 75047.

## Bore Holes.

The Alignment of Deep Bore Holes (Ueber Tiefbohrlochs-Lotapparate). F. Freise. Describing electrical and mechanical devices for insuring the maintenance of the vertical direction in drilling deep bore holes for mining and prospecting work. Serial. Part 1. 2000 w. 1 plate. *Oesterr Zeitschr f Berg u Hüttenwesen*—April 7, 1906. No. 76244 D.

A New Borehole Surveying Instrument. E. H. V. Melvill. Describes an instrument invented by Messrs. Lewis and Francks. Ills. 2500 w. *Jour S Africa Assn of Engrs*—Aug., 1906. No. 79570 F.

The Development of the Stratameter (Die Entwicklung der Stratameter). F. Freise. Describing improved apparatus for examining the stratification of underground strata by various forms of core drills. Serial. Part 1. 2500 w. 1 plate. *Oesterr Zeitschr f Berg u Hüttenwesen*—Oct. 13, 1906. No. 79935 D.

## Boring.

Improved Boring Appliances Shown at the Liège Exposition (Neue Bohrapparate auf der Lütticher Weltausstellung). Fritz Krull. Describing especially the Wolski hydraulic rock drill, and the Frieh & Nollenburg system for sinking shafts. 2000 w. 1 plate. *Oesterr Zeitschr f Berg u Hüttenwesen*—Oct. 21, 1905. No. 73-343 D.

The Recovery of a Diamond Crown from a Deep Bore-hole. Cuthbert Baring Horwood. Describes a recovery from a depth of 3,233 feet. Ills. 800 w. (No. 3473.) *Inst of Civ Engrs*. No. 73168 N.

## Brazil.

The Geology of the Diamond and Carbonado Washings of Bahia, Brazil. Orville A. Derby. Translation of a report to the Governor, and the most important paper thus far published on the geology of this region. 3000 w. *Ec Geol*—Nov., 1905. No. 74597 D.

## British Columbia.

British Columbia. E. Jacobs. A report of the mineral production of the year, the improvements and prospects. 1500 w. *Eng & Min Jour*—Jan. 6, 1906. No. 74265.

A Reconnaissance into Tulameen. B. C. Horace F. Evans. Notes describing the country between Kamloops on the south. Thompson and the Tulameen River. The present number is introductory. 1500 w. *Min Wld*—May 26, 1906. Serial. 1st part. No. 76979.

## MINING

## Chains

Blue Bell Mine and Pilot Bay Smelter, Kootenay Lake. E. Jacobs. Information concerning the early history, with notes of these enterprises as they are to-day. The ore is lead-zinc-silver. Ills. 4000 w. *B C Min Rec*—July, 1906. No. 78912 B.

Review of Present Condition of the Mining and Smelting Industries of British Columbia. E. Jacobs. A report of prosperous conditions, 1200 w. *B C Min Rec*—Aug., 1906. No. 79490 B.

## Cableways.

The Aërial Tramways at the Silver Cup Mine. George Attwood. Abstract of a paper in *Pro. of the Inst. of Civ. Engrs*. Illustrates and describes four tramways for conveying mining and food supplies, mining timbers and firewood, as well as passengers. 1600 w. *Eng & Min Jour*—Nov. 4, 1905. No. 73019.

## Cages.

Cage and Landing Chairs. R. D. O. Johnson. Describing the drop-bottom type of cage for use in deep mine hoists. The movable portion of the cage bottom holds the car securely during transit, and, with the accompanying landing chair, permits prompt unloading. Ill. 1400 w. *Eng & Min Jour*—March 3, 1906. No. 75333.

## California.

The Mining Industries of California. Charles G. Yale. A brief review of the mining industries of the State during the year of 1905. 2500 w. *Eng & Min Jour*—Jan. 6, 1906. No. 74257.

## Camps.

The Beginning of a Mining Camp. Prof. Arthur Lakes. Describes the starting point of a typical rough camp in the west. Ills. 1300 w. *Mines & Min.* March, 1906. No. 75450 C.

## Cascade Region.

International Geology of Cascade Region. Horace F. Evans. Presents geological information from reliable sources concerning the character of the region near the boundary of the United States on the western coast. 2500 w. *Min Wld*—Sept. 1, 1906. No. 78947.

## Caving System.

The Caving System of Mining. W. H. Storms. Discusses the mining of low-grade ores, explaining the caving system, and its successful operation, describing its application at the Pewabic mine at Iron Mountain, Mich. 2000 w. *Min & Sci Pr*—July 14, 1906. No. 78097.

## Chains.

Chains. W. Macpherson. Read before the Nat. Assn. of Col. Mgrs. An

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## Chert

illustrated paper on the use of chains at a colliery, their construction, upkeep, and the forms in which deterioration and decay manifest themselves. 4000 w. *Ir & Coal Trds Rev*—April 20, 1906. No. 76457 A.

## Chert.

Chert Mining in England and Wales. Herbert L. Terry. Defines chert, and gives information about the occurrence, properties, and applications of the stone, and the methods followed in mining it. 4000 w. *Inst of Min & Met*—May 17, 1906. No. 77008 N.

## Colombia.

Mining in Colombia. Henry G. Granger. An account of the early work of the placers and the methods used; and of the valuable emerald mines. 1600 w. *Eng & Min Jour*—Aug. 4, 1906. No. 78436.

## Colorado.

Metal Mining in Colorado During 1905. George E. Collins. A report of the year 1905, giving details of the various districts. 2300 w. *Eng & Min Jour*—Jan. 6, 1906. No. 74262.

Colorado. Kirby Thomas. Reports increased production in all districts with gratifying prospects for 1906. Ills. 10000 w. *Min Wld*—Jan. 27, 1906. No. 74785.

Undeveloped Empire of Middle Park, Colo. Etienne A. Ritter. Map and brief description of a mining region crossed by the new railroad from Denver to Salt Lake City. 1400 w. *Min Wld*—Sept. 22, 1906. No. 79426.

## Compressed Air.

Uses of Compressed Air in Coal Mines. J. L. Dixon. Read before the Coal Min. Inst. Calls attention to economies rendered possible by its use, and its application to safety stations in mines. 4500 w. *Mines & Min*—Sept., 1906. No. 78918 C.

## Concentration.

Concentrating in the Western Kentucky District. Abstract of a paper read by F. Julius Fohs, at Marion, Ky., in regard to the problem of separating fluor spar from lead and zinc ores. 1500 w. *Mines & Min*—Nov., 1905. No. 73035 C.

Mill Experiences. R. D. O. Johnson. An illustrated study of the problem of diminishing the excessive wear on all the parts of a concentrating mill. 1700 w. *Eng & Min Jour*—Feb. 17, 1906. No. 75038.

The Acme Combined Concentrating Table. L. H. L. Huddart. Illustrated description of a table intended for the treatment of metalliferous slimes, with report of a trial. 1500 w. *Min Rept*—Feb. 1, 1906. No. 74833.

## MINING

## Death Valley

The Sutton-Steele Process. R. C. Canby. Illustrations of the dry concentrating table and dielectric separator, and their operation. 1200 w. *Eng & Min Jour*—May 12, 1906. No. 76604.

## Concentrator.

A Lead and Zinc Concentrator at Roseberry, B. C. Alfred W. Dyer. Brief illustrated description. 1500 w. *Can Min Rev*—Jan., 1906. No. 74497 B.

## Crusher.

A Very Large Gyratory Crusher. Illustrated description of a rock crusher, believed to be the largest in the world. 1400 w. *Eng News*—May 3, 1906. No. 76478.

## Crushing.

The Effect of Variation in the Speed of Crushing Machinery Upon the Production of Undersized Material. H. W. Gartrell. An investigation of this subject showing that while decrease of speed tends to decrease the production of undersized material, it does so in a degree so small that it is disproportionate to the disadvantage of decreased capacity. 1200 w. *Sch of Mines Qr*—Nov., 1905. No. 74546 D.

## Costa Rica.

Mineral Deposits of Costa Rica. Francis C. Nicholas. An illustrated account of this island, reporting a well defined gold region, promising copper prospects, and an immense deposit of iron sand. 800 w. *Min Wld*—June 16, 1906. No. 77353.

## Costs.

Notes on Underground Mining Costs. H. Fraser Roche. Considers the cost of stoping, shovelling and tramming, development, etc. 3500 w. *Jour Chem, Met, & Min Soc of S Africa*—July, 1906. No. 79119 E.

## Dangers.

Imminent Mine Dangers. Hon. George Harrison. Abstracted from the Ohio Annual Report. Calls attention to the derangement of ventilation by electric haulage and its menace to the traveling ways. 1500 w. *Mines & Min*—Sept., 1906. No. 78916 C.

## Death Valley.

Notes on Death Valley and the Panamint. George D. James. An illustrated account of a trip to this region. Map. 3000 w. *Eng & Min Jour*—Nov. 18, 1905. No. 73238.

Explorations in Death Valley District. Col. E. F. Browne. Describes the geology and general appearance of this district and the conditions to be met. Information concerning the deposits and dangers

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## Deep Drilling

to be encountered. 3300 w. Min Wld—Jan. 20, 1906. No. 74488.

## Deep Drilling.

Modern Deep Drilling Practice in Europe. Will Halder. Sketches the development of modern methods of deep drilling, with special reference to those which depend upon a succession of quick blows with decreased height of fall. 2000 w. Min Mag—Jan., 1906. No. 74349 C.

## Deep Mining.

Considerations on Deep Mining. George Farmer. Read before the British Inst. of Min. Engrs. Discusses high temperature, increased ventilation, working, pressure, lighting, explosives, mechanical appliances, winding, etc. 4500 w. Ir & Coal Trds Rev—June 15, 1906. No. 77495 A.

## Deep Level.

Deep Level Shafts on the Rand. E. M. Weston. Comments based, in part, on personal experience. 2000 w. Aust Min Stand—Aug. 15, 1906. Serial. 1st part. No. 79488 B.

## Deposits.

Economic Geology and Mineral Deposits. Francis C. Nicholas. Gives a general description and classification according to the various periods of development. 1500 w. Min Wld—Sept. 8, 1906. Serial. 1st part. No. 79045.

## Dewatering.

The Fitzgerald Dewatering Screen. H. J. Baron. Drawing and description of a mechanism which has been in satisfactory use for three years for removing water from jig tailings. 500 w. Min Rept—Sept. 27, 1906. No. 79563.

## Disaster.

The Catastrophe at Courrières (La Catastrophe de Courrières). E. Lemaire. A discussion of French legislation relating to the responsibility in cases of accidents in mines, with especial reference to the disaster at Courrières. 3500 w. Génie Civil—April 28, 1906. No. 77609 D.

The Disaster at the Courrières Mine (La Catastrophe des Mines de Courrières). E. Lemaire. A review of the entire situation at the Courrières Mine near Lens, France, describing the workings and the disaster of March 10, 1906. 3000 w. Génie Civil—April 21, 1906. No. 77607 D.

Official Report of the Courrières Explosion. Review of the final report of the Government Commission appointed to enquire into the manner by which the State engineers conducted rescue operations after the Courrières explosion. 1500 w. Col Guard—Aug. 24, 1906. No. 79008 A.

## MINING

## Drilling

The Courrières Mine Disaster (Das Grubenunglück von Courrières). Fritz Schreyer. A general account of the catastrophe of the Courrières mine, discussing the conditions leading to the flow of gas and consequent explosion. 3000 w. Oesterr Zeitschr f Berg u Hüttenwesen—April 7, 1906. No. 76243 D.

## Divining Rods.

Unscientific and Scientific Divining Rods. George M. Hopkins. An illustrated article describing principally the scientific devices used in locating metal ores. 1800 w. Sci Am Sup—Jan. 20, 1906. No. 74443.

## Door Opener.

A Hydraulic-Pneumatic Mine Door Opener. L. L. Logan. Illustrated description of a safety derailing latch for operating any door against any pressure. 3000 w. Mines & Min—Jan., 1906. No. 74242 C.

## Drainage.

Drainage of the Cripple Creek District. D. W. Brunton. A report prepared for a committee appointed by Cripple Creek mine owners, giving interesting information concerning the tunnels, their cost, location, etc. Ills. 4500 w. Eng & Min Jour—Nov. 4, 1905. No. 73018.

Mine Drainage at the extreme acidity of the waters and the troubles due to this cause, illustrating and describing pumps used. 2500 w. Min & Sci Pr—Feb. 10, 1906. No. 75043.

Electric Mine Drainage Plant. Frank C. Perkins. Brief illustrated description of the electrically operated drainage plant installed by the Delaware, Lackawanna & Western Anthracite mine. 1000 w. Min Wld—Sept. 29, 1906. No. 79568.

Tests of the Drainage Plant of the Fransisca Mine at Witten (Versuche an der Wasserhaltung der Zeche Franziska in Witten). Report of the trials of the electric pumping plant of a mine in the Westphalia district, including tests of boilers, engines, dynamos, and pumps. 5000 w. Zeitschr d Ver Deutscher Ing—Sept. 29, 1906. No. 79903 D.

## Dredge.

An Improved Dipper Dredge. F. F. Coleman. Illustrated description of a new dipper dredge made by the Allis-Chalmers Company. 1000 w. Eng & Min Jour—Nov. 25, 1905. No. 73450.

## Drilling.

Recent Improvements in Core Drilling Without Diamonds. Lucius I. Wightman. Briefly describes the Davis system, and improvements added. Ills. 1200 w. Eng & Min Jour—Nov. 4, 1905. No. 73022.

# MINING AND METALLURGY

## Drills

The Relative Merits of Large and Small Drilling-Machines in Development Work. Frederick F. Williams. Discusses the relative merits of the large 3½-inch. machine and the small 2¼-in. tappett machine in driving development-headings. 1500 w. Bul Am Inst of Min Engrs—March, 1906. No. 76123.

Rock Drilling. W. A. T. Davies. Read before the Aust. Inst. of Min. Engrs. Discusses the selection of drills, method of rigging, working, etc. 2800 w. Aust Min Stand—Aug. 29, 1906. Serial. 1st part. No. 79595 B.

## Drills.

Air-Hammer Rock-Drills. Edward A. Rix. Abstract of a paper before the California Miners' Convention, on the advantages of these drills. 2800 w. Min & Sci Pr—Feb. 24, 1906. No. 75329.

The Comparative Merits of Air and Electric Drills. Granville E. Palmer. Considers the value of electrical apparatus questionable, giving reasons. 800 w. Eng & Min Jour—Aug. 18, 1906. No. 78632.

## Dynamite.

Thawing Dynamite. Reprinted from a booklet issued by the DuPont Co. Deals with the proper methods to be employed, and, gives plans for constructing a thawing house and other cheaper arrangements. 1500 w. Mines & Min—Aug., 1906. No. 78488 C.

## Earth Temperatures.

Earth Temperatures on the Witwatersrand Goldfields. Hugh F. Marriott. Abstract of a paper read before the Inst. of Min. & Met. A record of an investigation of earth temperatures and their relation to deep coal mining in the locality. 2200 w. Col Guard—March 23, 1906. No. 75904 A.

## Egypt.

Mining and Use of Metals by the Ancient Egyptians. Prof. R. D. George. Information on this subject gathered from many sources. 7000 w. Pop Sci M—Dec., 1905. No. 73419 C.

## Electrical Machinery.

Experiments at Gelsenkirchen with Electrical Appliances for Fiery Mines. Bergassessor Beyling, in *Glückauf*. Gives a summary of the interesting conclusions from these experiments. 2000 w. Col Guard—May 25, 1906. No. 77134 A.

Electrical Machinery for Mines. George Farmer. Gives suggestions for safeguarding against fire and explosion, discussing the danger. 2200 w. Cassier's Mag—Sept., 1906. No. 79249 B.

Electric Machinery for the Operation

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of Mexican Mines. Charles V. Allen. The second and concluding article discusses especially the hoisting machinery of the El Oro mine, describing the operations at the Somera shaft, 1500 feet deep. 2500 w. Engineering Magazine—Oct., 1906. No. 79384 B.

## Electric Plants.

Electrical Installation at the Hasard Colliery, Belgium. M. R. A. Henry. Abstract of a paper before the Min. Cong. at Liège. Illustrated description. 900 w. Col Guard—Dec. 29, 1905. No. 74295 A.

Some Electric Installations in European Mines. Emile Guarini. Illustrates and describes different kinds of apparatus for chain and locomotive haulage, hoisting and ventilating. 2500 w. Mines & Min—Jan., 1906. No. 74243 C.

## Electric Power.

Electrical Installation at the Wilhelmina Mine, Heerlen, Holland. W. Philippi. Describes the driving of centrifugal pumps by electricity. Abstract translation from the *Elektrotechnische Zeitschrift*. 1200 w. Elect'n, Lond—Oct. 12, 1906. No. 80051 A.

Electric Installation at the Bowhill Coal Company's Cardenden Pits. Illustrated description of the equipment for driving haulages, pumps, fans, and other power-using appliances. 1500 w. Col Guard—Oct. 12, 1906. No. 80053 A.

Electricity in Scottish Collieries. Information concerning the electrically-equipped collieries in Scotland. 1800 w. Elec Rev, Lond—Sept. 28, 1906. No. 79694 A.

Electricity as Applied to Mining. W. C. Mountain. The first of three lectures on this subject, to be given at the University College, Nottingham. A record of progress made in the application of electricity to coal mines, and suggestions for future applications. Ills. 7500 w. Ir & Coal Trds Rev—Dec. 1, 1905. No. 73686 A.

Electricity vs. Compressed Air for Mine Operations. Two papers on this subject are given. W. R. Hulbert discusses it from the electrical point of view; and Edward F. Schaefer from the compressed air point of view. 2800 w. Compressed Air—Dec., 1905. No. 73999.

Improvements in Electric Power for Mining Plants (Neuerungen bei Elektrischen Anlagen im Bergwerks und Hüttenbetrieb). Hr. Philippi. Comparing the Leonard and the Ilgner systems of regulation as applied to electric hoisting engines. 3000 w. Zeitschr d Ver Deutscher Ing—Nov. 18, 1905. No. 73801 D.

Improvements in Electric Operation of Coal Mines. George E. Walsh. An ac-

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## Electric Power

count of the operation of the mines in the vicinity of Scranton and Wilkesbarre, where electricity is generated at a central station and distributed for mine operation. 2200 w. Min Wld—Nov. 25, 1905. No. 73472.

Electricity at European Oil Wells. George E. Walsh. The dangers of present methods are discussed, and the avoiding them by installation of central stations and electric transmission. 2500 w. Mines & Min—March, 1906. No. 75457 C.

The Use of Electricity in Mines. R. G. Mercer. Abstract of a paper read before the Birmingham and District Electric Club. Considers its application to winding, haulage, pumping, coal-cutting, etc., discussing the distribution, systems, and economy. 3500 w. Elect'n, Lond—March 16, 1906. No. 75681 A.

Electricity in Mining (L'Electricité dans les Mines). Maurice Orban. A very complete description of the generating station and electrical equipment of the Hasard mines near Fleron, Belgium. Two articles. 7000 w. Soc Belge d'Electriciens—May, June, 1906. No. 78189, each F

Mining and Milling by Electric Power Machinery. Charles V. Allen. The first installment, with numerous illustrations of the application of electric power to mining operations. 3500 w. Engineering Magazine—August, 1906. No. 78193 B.

Notes on the Introduction of Electric Power into Large Coal Mining Plants (Einige Gesichtspunkte für die Errichtung Elektrischer Anlagen auf Grosseren Steinkohlenbergwerken). General suggestions as to prime movers, choice of current, switchboard arrangement, and working details; by the Dortmund Boiler Inspection Association. 4000 w. Glückauf—June 30, 1906. No. 78154 D.

Electric Machinery for the Operation of Mexican Mines. Charles V. Allen. A very fully illustrated description of the equipment of the mines at El Oro, near Fultenango, Mexico, working a gold and silver ore. 4000 w. Engineering Magazine—September, 1906. No. 78773 B.

See Electrical Engineering, Distribution.

## Explosions.

Mine Explosions. J. T. Beard. Discusses the dangers and the factors that influence a mine explosion. 3500 w. Eng & Min Jour—May 19, 1906. No. 76731.

The Wattstown Colliery Explosion. Notes on the disaster that occurred July

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11, 1905, by James Ashworth, and an official report. 9000 w. Ir & Coal Trds Rev—Dec. 1, 1905. No. 73685 A.

## Explosives.

The Nature of Nitro Explosives (Ueber das Wesen der Nitro-Sprengstoffe). O. Stegemann. Discussing especially the chemistry and action of the nitro-glycerin explosives used in mining operations. 3000 w. Glückauf—Dec. 30, 1905. No. 74654 D.

Explosives in Coal Mines. Extracts from the last order issued from the Home Office, giving particulars of a number of explosives. 700 w. Col Guard—Sept. 7, 1906. No. 79231 A.

## Exposition.

Mining at the Liège Exposition (Der Bergbau auf der Lütticher Weltausstellung). F. Herbst. An extended descriptive and critical review of the mining appliances and methods shown at the exposition. Serial. Part I. 4000 w. Glückauf—Oct. 21, 1905. No. 73338 D.

## Fans.

The largest Fan in Existence. Report some tests made at the Ronco mine, in Fayette Co., Pennsylvania, comparing with another large fan in regard to volume, size, and efficiency. Ills. 800 w. Mines & Min—March, 1906. No. 75456 C.

## Faults.

An Interesting Fault-System. C. G. Gunther. Brief description, with vertical section, of an unusual system opened up in the New York mine, in Siskeyou county. 400 w. Eng & Min Jour—Dec. 2, 1905. No. 73534.

Classification of Faults and Fractures into Series and Sets, and Its Practical Application. F. Julius Fohs. Abstracted from forthcoming reports on the deposits of western Kentucky. 1500 w. Eng & Min Jour—March 24, 1906. No. 75660.

The Fault System of Eastern Santa Eulalia. M. A. Knapp. Illustrated description of the geological formation of this silver-lead region in Mexico. 1200 w. Eng & Min Jour—May 26, 1906. No. 76968.

## Filled Ground.

Reopening Filled Ground. Robert B. Brinsmade. Describes an interesting example, at Tombstone, Arizona, of an efficient system for the penetration of old filling. Ills. 1000 w. Eng & Min Jour—Aug. 25, 1906. No. 78816.

## Filling.

The Hydraulic Filling of a Coal Seam at Lens, Pas de Calais, France. Lionel E. Hill and Malcolm Burr. Read before the

# MINING AND METALLURGY

## Fire Damp

Inst. of Min. & Met. An illustrated description of the process as adapted to the collieries at Lens. 3500 w. Ir & Coal Trds Rev—Feb. 16, 1906. No. 75291 A.

Conveying Filling Material by Water (Le Remblayage par l'Eau). H. Schmerber. Describing the use of flowing water in pipes as a means of conveying rock or other filling material into disused workings. Examples from various mines are given. Two articles. 5000 w. Génie Civil—May 26, June 2, 1906. No. 78118, each D.

## Fire Damp.

Mine Temperatures and the Influence of Natural Weather Conditions Upon the Production of Firedamp (Ueber Grubenlufttemperaturen und den Einfluss des Natürlichen Wetterzuges auf die Wetterwirtschaft bei Einigen Tiefen Schächten des Brüxer Braun Kohlen reviers). L. Stadlmayr. Data showing the relation of the release of mine gases to external weather conditions. Serial. Part I. Oesterr Zeitschr f Berg u Hüttenwesen—Jan. 6, 1906. No. 74651 D.

Tests of Devices to Protect Electric Apparatus from Firedamp (Versuche zwecks Erprobung der Schlagwettersicherheit besonders Geschützter Elektrischer Motoren und Apparate). H. Beyling. An illustrated account of tests in the experimental tunnel at Gelsenkirchen upon the ignition of firedamp from electrical apparatus. Serial. Part I. 3000 w. Glückauf—Jan. 6, 1906. No. 74655 D.

The Beard-Mackie Light-Indicator for the Measurement of Marsh-Gas in Collieries. M. H. Harrington. An illustrated description of this indicator, which has been successfully tested in practice. 2800 w. Am Inst of Min Engrs—Jan., 1906. No. 74714.

A Study of Firedamp and the Protection of Electric Machinery. (Versuche mit Schlagwettern und dem Schlagwetterschutz Elektrischer Antriebe). Dr. H. Hoffman. A review of the investigations of Baum, Beyling, and others, upon the best methods of preventing the ignition of mine gases from electric machinery. Two articles—8000 w. Zeitschr d Ver Deutscher Ing—March 24, 31, 1906. No. 76201 each D.

A New Apparatus for the Control of Firedamp (Ueber einen Neuen Apparat zur Kontrolle der Grubenbewetterung). H. Breyhahn. The apparatus consists of a pair of counter balancing gas holders, enabling the changes in motion and condition of the mine atmosphere to be recorded on a moving paper diagram. 3000 w. Glückauf—Oct. 13, 1906. No. 79939 B

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## Germany

Gassing. E. A. Mann. Deals with the cause and prevention of the ill effects due to the inhalation of noxious fumes by miners. 3000 w. Aust Min Stand—Sept. 26, 1906. Serial. 1st part. No. 80150 B.

The Ignition of Firedamp by Electric Sparks (Recherches sur l'Inflammation Electrique des Mélanges Explosifs d'Air et de Grisou). MM. H. Couriot and J. Meunier. A study of the explosive character of mixtures of air and firedamp, with regard to the use of electric machinery in collieries. Serial. Part 1. 3000 w. Génie Civil—Oct. 6, 1906. No. 79913 D.

## Fires.

Controlling and Extinguishing Fires in Pyritous Mines. Lewis T. Wright. Explains the causes of such fires, and the system adopted by the writer for extinguishing and controlling them. 1800 w. Eng & Min Jour—Jan. 27, 1906. No. 74727.

Fire Fighting with Continuous Ventilation in Gaseous Mines (Grubenbrandgewältigung bei Unzulässiger Ventilation in Gasreichen Kohlengruben). Johann Mayer. The miners are provided with suits and helmets supplied with air through hose connected to a central supply. 1500 w. 1 plate. Oesterr Zeitschr f Berg u Hüttenwesen—July 7, 1906. No. 78152 D.

## Fissures.

The Fissure System of the Ontario Mineral Belt. W. P. Jenney. Description, with diagrams, of the mineral bearing veins and the verticals. 2200 w. Min & Sci Pr—Jan. 13, 1906. No. 74493.

## Freezing.

The Development of the Freezing Process Since its Introduction in 1883 (Die Entwicklung des Gefrierverfahrens seit seiner Ersten Anwendung im Jahre 1883). H. J. Joosten. A long tabulated account of various shafts sunk through quicksand by the aid of the Poetsch freezing process. 10000 w. Glückauf—June 2, 1906. No. 77630 B.

## Garnet Zones.

On the Formation of Garnet Zones at the Contacts of Eruptive Rocks and Limestones. James F. Kemp. A study of these zones, explaining the essential points which geologists have worked out regarding them. 3500 w. Min & Sci Pr—March 31, 1906. No. 75974.

## Germany.

The Distribution of Minerals in the Werden Mining District and its Environs (Die Mineralausfüllung der Quarverwerfungsspalten im Bergrevier Werden und einigen Angrenzenden Gebie-

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## Hand-Drilling

ten). H. E. Böker. An examination of the geology of Rhenish Prussia, with especial reference to its mining resources. Two articles. 10000 w. Glückauf—Aug. 18, 25, 1906. No. 79341, each D.

## Hand-Drilling.

Methods of Hand-Drilling. W. R. Hulbert. Discusses the various systems of hand-drilling so as to give an idea of their relative merits. 900 w. Min & Sci Pr—May 12, 1906. No. 76722.

## Hard Ground.

Mining Hard Ground. W. A. T. Davies. Abstract of a paper on "The Science of Economically Mining Hard Ground with Percussive Rock Drills and Compressed Air," given in the *Transactions* of the Australasian Inst. of Min. Engrs. Describes methods of working. 3000 w. Eng & Min Jour—Oct. 27, 1906. No. 80106.

## Haulage.

The Application of the Mono Rails in Underground Tramming at the Langlaagte Deep. Wager Bradford. A brief description, with illustrations, of a successful installation of a mono rail system of motor traction, suspended from the roof. 5000 w. Jour S African Ass'n of Engrs—Dec., 1905. No. 74866 F.

European Mining Locomotives. Frank C. Perkins. Illustrations and descriptions of some types of electric, compressed air, and gasoline locomotives for use in mines. 1200 w. Mines & Min—April, 1906. No. 75965 C.

The Operation of Mine Locomotives (Betriebsergebnisse bei den Vöderung mit Gruben lokomotiven). S. Schaubberger. Describing the use of gasoline and compressed-air locomotives for underground hauling, with data as to the cost of operation. 2500 w. Oesterr Zeitschr f Berg u Hüttenwesen—March 31, 1906. No. 76241 D.

Notes on Top and Bottom Endless Rope Haulage on Curves at Bedlington Collieries. E. Graham. Read before the Nat Assn. of Colliery Mgrs. Illustrated description of the methods adopted. Discussion. 4000 w. Ir & Coal Trds Rev—June 8, 1906. No. 77394 A.

A Rateau Exhaust Steam-Driven Three-Phase Haulage Plant. William Maurice. Abstract of paper read before the Inst. of Min. Engrs. Introductory remarks with a description of a Rateau installation to supply power for underground haulage. 2000 w. Ir & Coal Trds Rev—June 22, 1906. No. 77788 A.

Haulage in Iron Mines of Alabama. W. R. Crane. Illustrates and describes the system in use in the hard iron-ore

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mines of the Birmingham district. 2000 w. Min & Sci Pr—Aug. 25, 1906. No. 78945.

## Head-Frames.

Head-Frames. W. R. Crane. On the principles of construction as illustrated by frames constructed at various mines. Ills. Gives also a list of papers and illustrations of head-frames and tipples, and a table of data. 4500 w. Mines & Min—April, 1906. No. 75968 C.

Modern Types of Large Mine Head Frames. Bergassessor Brandi. Illustrated descriptions of types used at German mines. 2000 w. Min Mag—May, 1906. No. 76905 C.

The Leonard Head-Frame. A. H. Halloran. Illustration, with brief description of the new head-frame recently erected at the Leonard shaft of the Boston & Montana Copper Mining Co., which embodies the most modern ideas in steel construction. 500 w. Min & Sci Pr—June 30, 1906. No. 77856.

## Hoist.

An Induction-Motor Hoist. C. F. Lehman. Describes its use in the North Star Mines at Grass Valley, California. 1200 w. Min & Sci Pr—July 28, 1906. No. 78433.

## Hoisting.

Electrical Mining Hoists. J. W. H. Hamilton. An illustrated description of the hoisting system devised by Carl Ilgner, chief engineer of the Austrian firm of Siemens-Schuckert-Werke. 2200 w. Eng & Min Jour—Sept. 22, 1906. No. 79412.

Recent Installations of Electric Winding Engines (Neuere Ausführungen von Elektrischen Fördermaschinen). Karl Ilgner. A well illustrated description of the installations of the Ilgner-Siemens-Schuckert system at Merklinde, Dortmund; at Karwin, Silesia; and at Witkowitz, Austria; showing good performance in deep shafts. Two articles. 5000 w. Elektrotech u Maschinenbau—Aug. 26, Sept. 2, 1906. No. 79362 each D.

Skip Hoisting. S. A. Worcester. An illustrated article explaining the advantages of the self-dumping skip for hoisting ore and waste rock, and comparing it with the cage. 1200 w. Eng & Min Jour—Sept. 1, 1906. No. 78934.

The Factor of Safety in Winding Ropes. J. A. Vaughan. Gives the principal points presented in a paper to the South African Assn. of Engrs. in 1904, entitled "An Investigation Regarding the Effect of Kinetic Shocks on Winding ropes in Vertical Shafts." 3000 w. Engr,



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## Hoisting

Lond—Aug. 24, 1906. Serial. 1st part. No. 79015 A.

The Main Electric Winding Engine at the Coal Mines at Ligny-les-Aire (Die Elektrisch Betriebene Hauptschacht fördermaschine der Compagnie des Mines de Houille de Ligny-les-Aire). H. Damm. An illustrated account of the design and operation of electric winding machinery operating to a depth of 270 metres. 3500 w. Glückauf—Sept. 15 1906. No. 79344 D.

A Bucket Elevator Installation for a 155-Ft. Zinc Mine Shaft. Illustrated description of a continuous bucket elevator installed at Carthage, Mo., to raise zinc ore from an inclined shaft. 600 w. Eng News—Dec. 7, 1905. No. 73625.

A Novel Water Hoist. Illustrates and describes the electric automatic arrangement for hoisting water at the Hampton-Central water shaft of the D. L. & W. R. R. Co. 1400 w. Mines & Min—Dec., 1905. No. 73715 C.

Electricity in Continental Mines. C. Smith. Illustrated description of some German hoisting plants having interesting features. 3500 w. Mines & Min—Dec., 1905. No. 73714 C.

Mine Hoisting with Driving Sheaves (Die Förderung mit Treibscheibe). H. Baumann. A review of the Koepe system of winding, using driving sheaves instead of drums, showing its application to deep shafts. 2000 w. Glückauf—Nov. 25, 1905. No. 73841 D.

The Aerial Rail Hoist and Haulage System. W. R. Crane. Illustrated description of apparatus recently installed for raising and transporting ore in the Joplin region. 2000 w. Mines & Min—Dec., 1905. No. 73712 C.

Hoisting Methods at Butte. A. H. Wethey. An illustrated article giving the results of 18 years experience with hoisting in the mines of W. A. Clark, at Butte, Mon. 1500 w. Eng & Min Jour—March 10, 1906. No. 75462.

Tests upon the Weakening of Hoist-Cables from Broken Wires (Versuche über die Unsichere Drahtlänge bei Drahtbrüchen in Förderseilen) Hermann Kroen. Detailed report of tests of wire rope cables to ascertain the effect of the breaking of isolated wires. 4000 w. Oesterr Zeitschr f Berg u Hüttenwesen—March 3, 1906. No. 75740 D.

## Hydraulic Mining.

The Control of Hydraulic Mining in California by the Federal Government. William W. Harts. Explains the debris problem, describing the mining region and methods, the duties of the Commis-

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sion, the general principles of improvement, etc. Ill. 11500 w. Pro Am Soc of Civ Engrs—Feb., 1906. No. 75342 E.

Hydraulic Mining in California. J. P. Hutchins. An account of this method of mining, the problems and difficulties, results, and present standing. Ills. 2800 w. Eng & Min Jour—May 19, 1906. No. 76729.

The Control of Hydraulic Mining in California by the Federal Government. Discussion of the paper by William W. Harts. 4500 w. Pr Am Soc of Civ Engrs—May, 1906. No. 76933 E.

## Idaho.

Mining in Idaho in 1905. Robert N. Bell. A review of the mining developments for the year, not including the Couer d' Alene district, which is reported separately. 2300 w. Eng & Min Jour—Jan. 6, 1906. No. 74258.

## Impact Screen.

On the Use of the Impact Screen in Tin-Dressing. J. H. Collins. Note on the first use of the impact screen in the United Kingdom, and, so far as known, its first application to tin-dressing. 400 w. Inst of Min & Met—April 19, 1906. No. 77000 N.

## Japan.

The Mining Industry in Japan. W. J. Johnston. Statistical data concerning the growth of the mining industry in Japan, and notes on the present status of the industry. 4000 w. Min Mag—Jan., 1906. No. 74348 C.

## Joplin.

Structural Features of the Joplin District. C. E. Siebenthal. Reviews the work that has been done in studying this district, and states the conclusions reached. Also discussion by H. Foster Bain. 4400 w. Ec Geol—Nov., 1905. No. 74595 D.

Joplin Re-visited. F. Lynwood Garrison. Notes on the changes in this lead and zinc district during the last six years. Ills. 2000 w. Min & Sci Pr—May 26, 1906. No. 77092.

## Kaolin.

A Novel Method of Mining Kaolin. Albert R. Ledoux. Describes the method adopted by Mr. M. Wanner, at West Cornwall, Conn., for mining kaolin from deep deposits without shaft-sinking or removing of the overburden. 900 w. Bul Am Inst of Min Engrs—May, 1906. No. 77173.

## Klondike.

The Klondike in 1905. J. P. Hutchins. Discusses the causes of the lessened production, the mining methods, water sup-

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## Korea

ply, mining laws and regulations. 2500 w. Eng & Min Jour—Jan. 6, 1906. No. 74256.

## Korea.

Mining in Korea. J. H. Curle. An illustrated account of mining conditions, labor, etc., principally relating to gold mining. 1700 w. Min & Sci Pr—July 21, 1906. No. 78284.

## Ladders.

Making Mine Ladders. Matt. W. Alderson. Remarks on the requirements of mine ladders, with illustrations of types. 1200 w. Min & Sci Pr—Feb. 24, 1906. No. 75328.

## Lake Superior.

Drifting and Stopping at Lake Superior. W. R. Crane. An analytical discussion of the methods and costs. 1600 w. Eng & Min Jour—Oct. 6, 1906. No. 79666.

Underground Ore Handling at Lake Superior. W. R. Crane. A practical discussion of the methods at Wolverine and Mohawk mines, describing a new system of tramping. Ills. 2000 w. Eng & Min Jour—Oct. 13, 1906. No. 79779.

## Launders.

Sand Launderers. Thomas T. Read. Information regarding the use of launders for the movement of solid material in water currents. 900 w. Eng & Min Jour—Dec. 16, 1905. No. 73775.

## Lighting.

Electric Lighting in Subterranean Workings (*Elektrische Beleuchtung an Füllörter und in Strecken unter Tage*). E. Anders. A general description of underground electric lighting appliances in accordance with the official mining regulations of Germany. 4000 w. Glückauf—Feb. 3, 1906. No. 75133 B.

Acetylene Lighting in the Iron Mines of Lorraine (*Azetylenbeleuchtung beim Lothringischen Eisenerzbergbau*). W. Serlo. With details of burners and portable acetylene generators, especially designed for mining use. 5000 w. Glückauf—April 28, 1906. No. 76823 D.

## Lime Roasting.

The Huntington-Heberlein Process. Thomas Huntington and Ferdinand Heberlein. An account of this lime roasting process for the desulphurization of lead ores. Also editorial. 3500 w. Eng & Min Jour—May 26, 1906. No. 76970.

The Lime-Roasting of Galena. W. R. Ingalls. Reviews the changes developed by the new processes for the desulphurization of lead, and points out the differences among the three lime-roasting processes that are in practical use. 8500 w. Bul Am Inst of Min Engrs—Sept., 1906. No.

## MINING

## Methods

### Machine Mining.

Electrically-Driven Air-Compressors Combined with the Working of the Ingersoll-Sergeant Heading-Machines and Subsequent Working of the Busty Seam at Ouston Colliery. A. Thompson. Read before the British Inst. of Min. Engrs. Describes the work and compares the results and costs with hand labor. 3500 w. Ir & Coal Trds Rev—June 15, 1906. No. 77491 A.

Labor-Saving Machinery in Coal Mining. F. W. Parsons. Deals with the advances made in the mechanical handling of coal both under and above ground. 1700 w. Eng & Min Jour—June 16, 1906. No. 77312.

Practical Problems of Machine Mining. Sam Mavor. Read before the British Inst. of Min. Engrs. A brief review of a lengthy paper covering practically the whole field of machine mining. 1000 w. Ir & Coal Trds Rev—June 15, 1906. No. 77492 A.

### Madagascar.

Madagascar Mining. M. S. Stutchbury. Discusses the new law recently passed. 900 w. Eng & Min Jour—Sept. 8, 1906. No. 79054.

### Manganese.

The Demand for Manganese Ores. W. Venator. Translated from *Stahl und Eisen*. Reviews the growing importance of these ores and the industry of mining them, the difficulties, and related subjects of interest. 2800 w. Min Jour—Feb. 10, 1906. Serial. 1st part. No. 75083 A.

### Management.

Mine Management. Charlton Dixon. Discusses the qualities that distinguish the successful from the unsuccessful manager. 3500 w. Mines & Min—Aug., 1906. No. 78487 C.

A Puncher Machine Mine. Charlton Dixon. Discusses some of the difficulties of management and their causes, with suggestions for obtaining the greatest efficiency of plant. 5000 w. Mines & Min—Nov., 1905. No. 73039 C.

### Matte.

A New Matte Separator. R. R. Hedley. Read before the Can. Min. Inst. Illustrates and describes a device invented by Henry Harris, successfully used in the Lead Smelting Works at Nelson, B. C. 1200 w. Can Min Rev—May, 1906. No. 76972 B.

### Methods.

Mining Methods. W. H. Storms. Specially referring to mining practice in California. 1200 w. Min & Sci Pr—Feb. 10, 1906. Serial. 1st part. No. 75044.

# Mining and Metallurgy

## Mexico

### Mexico.

Geology of Sonora, Mexico. F. J. H. Merrill. Information concerning the geological formations. 1200 w. Eng & Min Jour—Nov. 25, 1905. No. 73451.

Fine Grinding Ore by Tube-Mills, and Cyaniding at El Oro, Mexico. G. Caetani and E. Burt. Gives the results of a series of experiments and tests made in view of determining the economical limit to which the fine grinding of ore by tube-mills could be carried. 15800 w. Am Inst of Min Engrs—Jan., 1906. No. 74716 D.

Mexico. James W. Malcolmson. A report of the mineral industry and its progress during the past year. 2000 w. Eng & Min Jour—Jan. 6, 1906. No. 74266.

Minas Prietas Reduction Works. Mark R. Lamb. Illustrated description of the Grand Central mill and its treatment of the low-grade ores. 1000 w. Min & Sci Pr—Aug. 4, 1906. No. 78567. Brief Notes on Mining Before the Conquest. Eduardo Martinez Baca. 600 w. Min Wld—Sept. 15, 1906. No. 79209.

Mexico. Robert Thomas Hill. The first of a series of illustrated articles describing the physical features, geology, mines, ore deposits, and economic industries, and giving much information of interest. 2800 w. Min Wld—Sept. 22, 1906. Serial. 1st part. No. 79425.

Mining in Mexico: Past and Present. Historical review of the mining industry. 2800 w. Min Wld—Sept. 15, 1906. No. 79208.

### Mica.

Mica. Phillips Thompson. A description of a monograph on mica, by Fritz Cirkel, with information from this source. 2000 w. Eng & Min Jour—Nov. 4, 1905. No. 73021.

### Mill.

The Daly-Judge Mill. Illustrated description of a mill of the side-hill type built in Empire Cañon. 1000 w. Eng & Min Jour—Aug. 11, 1906. No. 78504.

### Milling.

Milling Practice at the North Star Mine, Nevada County, California. G. E. Alexander. An illustrated description of the unusual features of the mill, and of the electric precipitation, and other applications of electric power. 1400 w. Min Rept—July 19, 1906. No. 78090.

Ore Milling in Wisconsin. Illustrates and describes the milling practice used in the zinc-lead district. The wet concentrating, and the magnetic separation processes are described. 1800 w. Eng & Min Jour—July 28, 1906. No. 78282.

## MINING

### Mine Cars.

A Revolvable Car Dump. Erskine Ramsay. Illustrated description of a new device for unloading trains of mine cars at one operation. 2000 w. Eng & Min Jour—Oct. 20, 1906. No. 79877.

### Mine Development.

Developing a Prospect. Arthur Lakes. Discusses mistakes, difficulties and conditions encountered. Ills. 1700 w. Min & Sci Pr—Sept. 22, 1906. No. 79541.

### Mine Examination.

The Examination of Mines Preliminary to Purchase: To-day as Compared with Twenty-five Years Ago. R. Gilman Brown. Read before the Am. Min. Cong. A paper containing information of value to engineers, students, miners, and the general public. 3500 w. Min & Sci Pr—Nov. 25, 1905. No. 73509.

### Mine Fires.

Extinguishing a Mine Fire. Lewis T. Wright. An address delivered before the Mining Conference describing a fire occurring in the Iron Mountain mine, Shasta County, California, and how it was extinguished. 1500 w. Cal Jour of Tech—Feb., 1906. No. 75960 C.

### Mine Power.

The Distribution of Power on Mines. Contribution to the discussion of the paper by C. E. Hutton. A. E. Payne describes a system of apportionment of charges under power account at the mine of the new Primrose G. M. Co., Ltd. 1000 w. Jour S African Assn of Engrs—May, 1906. No. 77775 F.

### Mine Surveying.

The Qualifications of a Mine Surveyor. Henry Briggs. Discusses the methods in England as compared with the United States and Germany, urging an improvement, and outlining the methods now being taught. 1600 w. Col Guard—July 6, 1906. No. 77977 A.

### Mine Telephones.

Telephone Lines in Coal Mines. C. M. Means. Some suggestions for the construction of these underground lines. 1200 w. Eng & Min Jour—Feb. 24, 1906. No. 75256.

### Mine Workings.

A Reference Scheme for Mine-Workings. Wilbur E. Sanders. Explains the need and gives a reference scheme for numbering and naming points and parts of mine-workings. Plans. 3000 w. Bul Am Inst of Min Engrs—May, 1906. No. 77170.

### Mine Ventilation.

Electrically-Operated Ventilating Plant in Northberg Pit, Germany. Alfred

## Mine Ventilation

# MINING AND METALLURGY

## Mining

Gradenwitz. Illustrates and describes an arrangement to utilize the advantages of alternating currents in the transmission of energy. 1700 w. Eng & Min Jour—July 14, 1906. No. 77943.

## Mining.

Legitimate and Illegitimate Mining. Thomas Tonge. Abridged report of an address before the Students' Technical Society of the Colorado School of Mines. 4500 w. Min Jour—Nov. 11, 1905. No. 73285 A.

## Mining Debris.

Control of Hydraulic Mining Débris in California by the Federal Government. Capt. Wm. W. Harts. Read before the Mining Conference. Explains the problem, the extent of the damage, discussing the duties of the commission, and the general principles of improvement. Ills. 6000 w. Cal Jour of Tech—Sept., 1905. No. 74079 C.

## Mining Hints.

Economic Mining Hints. P. A. Leonard. Emphasizes the importance of good management, and a study of local conditions, the cost of transportation and reduction. 1700 w. Min Wld—Jan. 20, 1906. No. 74487.

## Mining Law.

The American Law Relating to Minerals. Charles H. Shamel. An exposition of that part of American mining law that deals with the definitions and the legal conception of the terms mineral, ore, &c., as used in law. 10800 w. Sch of Mines Qr—Nov., 1905. No. 74545 D.

The Present Mining Law of Pennsylvania. Thomas K. Adams. Read before the W. Penn. Cent. Min. Inst. Discusses whether it should be revised, and how, suggesting some changes. 2800 w. Mines & Min—Jan., 1906. No. 74247 C.

Amendments to Federal Mining Law. R. S. Morrison. Read before the Min. Cong. at El Paso. Discusses some of the points in which the present law is unsatisfactory. 1500 w. Mines & Min—Feb., 1906. No. 74931 C.

The New Queensland Mining Bill. Gives an outline of the bill before the Legislative Assembly, which aims to remedy certain defects and supply shortcomings in the present Mining Act. 7500 w. Queens Gov Min Jour—Dec. 15, 1905. No. 74868 B.

The U. S. Supreme Court and the U. S. Mining Law. R. W. Raymond. General remarks, with a notice of the "Stemwinder" and "Bunker Hill" cases. 2000 w. Eng & Min Jour—Feb. 10, 1906. No. 74941.

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## Mining Properties

The Grand Central—Mammoth Decision. Describes the mines in dispute and reviews the second trial in the present number. 4300 w. Min & Sci Pr—Jan. 31, 1906. Serial, 1st part. No. 75562.

The Bituminous Mining Law of Pennsylvania. Charlton Dixon. Gives detailed suggestions for its improvement. Also editorial. 5500 w. Mines & Min—Sept., 1906. No. 78914 C.

Amendments Advisable to State Laws Affecting Mining Operations. Wilson S. Snyder. Read before the Am. Min. Cong. Discusses the changes desirable, and the means of attaining them. 1700 w. Min Rept—Oct. 25, 1906. No. 80119.

## Mining Locomotives.

Electric Mining Locomotives in Great Britain. J. F. Gairns. Illustrated description of types employed in British practice. 800 w. Eng & Min Jour—July 7, 1906. No. 77844.

## Mining Methods.

Coal Mining Methods. The characteristics of the deposits, which determine the method of mining, are described; the room-pillar and long-wall systems and their modifications, stating the conditions favoring long-wall mining. 2000 w. Eng & Min Jour—Nov. 18, 1905. No. 73242.

Methods of Mining, Hauling, and Screening at the Mines of the Aldrich Mining Company, at Brilliant, Alabama. T. H. Aldrich, Jr. States the conditions of the problem to be met and the solution. 6000 w. Bul Am Inst of Min Engrs—July, 1906. No. 78252 C.

## Mining Plants.

The Erection and Working of Mining Plants. Discusses the economies and efficiencies that may be obtained in the practical working and equipping of such plants. 3500 w. Min Jour—Sept. 15, 1906. Serial. 1st part. No. 79448 A.

## Mining Problems.

The Graphical Solution of Mining Problems. Leo Gluck. Illustrates and describes an apparatus designed by the writer for the solution of many problems without requiring the use of mathematical formulæ. 1800 w. Min Wld—Jan. 13, 1906. No. 74371.

## Mining Properties.

Examining Mining Properties. Prof. Arthur Lakes. Suggestions as to methods of proceeding and facts to be included in reports on properties. Ills. 1600 w. Mines & Min—Nov., 1905. No. 73037 C.

# MINING AND METALLURGY

## Montana

### Montana.

Montana in 1905. A. Selwyn-Brown. A report of the year, giving information in regard to the output of copper, silver, gold, zinc, coal, and sapphires. 1800 w. Eng & Min Jour—Jan. 6, 1906. No. 74263.

Montana. Reports of prosperity of metal mining enterprises throughout the state. 11000 w. Ills. Min Wld—Jan. 27, 1906. No. 74786.

Montana Mining for 1905. E. W. King. Presidential address to the Montana Soc. of Engrs. On the advancement made, with a description of the Weber steel concrete chimney, the largest in the United States. 2000 w. Mines & Min—Aug., 1906. No. 78486 C.

### Motive Power.

Motive Power in Mines. C. H. Caruthers. Briefly refers to the use of animals, and rope haulage in mines, and considers haulage by steam, compressed air and electric locomotives. Ills. 2000 w. R R Gaz—Vol. XL. No. 5. No. 74822

### Natal.

Natal's Mineral Prospects. Ralph Stokes. Reviews the condition of the mining industry, reporting the output of coal, and unimportant deposits of gold and of copper. 2000 w. Min Wld—April 7, 1906. No. 75978.

### Nevada.

Nevada in 1905. A. Selwyn-Brown. An interesting review of a prosperous year, with illustrations of Tonopah. 2000 w. Eng & Min Jour—Jan. 6, 1906. No. 74261.

Manhattan. A. H. Halloran. An illustrated report of this mining district in Nevada, with a criticism of methods that have been tried to attract capital. 1800 w. Min & Sci Pr—June 9, 1906. No. 77359.

The Mines and Prospects of Searchlight District, Nevada. W. A. Root. An illustrated article describing the producing properties of this district. 2000 w. Min Wld—Oct. 20, 1906. No. 80012.

### New Mexico.

Mines and Reduction Works of the Comanche Mining and Smelting Company. Information concerning the enterprises of this company, especially in Grant and Socorro counties. 2000 w. Min Rept—May 3, 1906. Serial. 1st part. No. 76537.

History and Prospects of the Black Range, New Mexico. C. H. Laidlaw. Describes the northern Black range and adjacent districts, giving a brief outline of their history, geology and mineral resources. Ills. 2000 w. Min Rept—Aug. 23, 1906. No. 78826.

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## Ore Deposits

### New South Wales.

Mining at Broken Hill, New South Wales. Extracts from a speech by Mr. Harvey Patterson, explaining the conditions of mining. 2800 w. N Z Mines Rec—March 16, 1906. No. 76553 B.

### New Zealand.

Mining and Metallurgical Methods of the Waihi Gold Mining Company, New Zealand. F. N. Rhodes. Illustrated detailed description of the processes adopted at the works of the Waihi Gold Mining Company for the mining and treatment of gold ores. 2800 w. Min Mag—Jan., 1906. No. 74347 C.

### Nuggets.

How Nuggets May Be Made. Charles S. Palmer. Presents a theory that may explain the origin of nuggets of copper, silver, or gold. 1600 w. Min & Sci Pr—Sept. 15, 1906. No. 79421.

### Ontario.

Some Timiskaming Ores. Phillips Thompson. Information from a paper by Prof. W. G. Miller concerning the silver-cobalt-nickel-arsenic ores of northern Ontario. 1800 w. Map. Eng & Min Jour—Dec. 2, 1905. No. 73537.

### Operation.

Electricity vs. Compressed Air for Mine Operation. Edward F. Schaefer. Discusses the advantages of each but considers compressed air far superior as a driving fluid. 2000 w. Sib Jour of Engng—Feb., 1906. No. 75271 C.

Some General Principles Governing the Operation of Mines. J. R. Finlay. General remarks with a division of mines into three classes, giving a scheme of cost-keeping, and stating the general principles claimed. 1600 w. Min & Sci Pr—July 21, 1906. No. 78285.

### Ore-Bodies.

Magmatic Segregation in its Relation to the Genesis of Certain Ore-Bodies. James Park. Discusses magmatic border segregation, and processes and ore deposition from igneous magmas. 1600 w. N Z Mines Rec—May 16, 1906. No. 78397 B.

Large Orebodies in Australia—Mining Methods. A. Selwyn Brown. A brief sketch of some of the more important methods adopted. 1500 w. Eng & Min Jour—Nov. 25, 1905. No. 73447.

### Ore Deposits.

Some of the Veins and Ore Deposits of the Wood River District, Idaho. Arthur Lakes. Describes the occurrence and mode of vein formation and ore deposition in this region. 2000 w. Min Wld—Dec. 23, 1905. No. 74007.

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## Ore Deposits

The Limestone-Granite Contact-Deposits of Washington Camp, Arizona. W. O. Crosby. A discussion of the general geology, the ore deposits, the metamorphism of the limestone and chert, &c. 9000 w. Am Inst of Min Engrs—Nov., 1905. No. 73959 C.

Theories of Ore Deposition Historically Considered. S. F. Emmons. Address before the Geol. Soc. of America, at St. Louis. Gives the opinions held on this subject which have most impressed the minds of geologists. 3500 w. Sci Am Sup—Dec. 16, 1905. Serial. 1st part. No. 73730.

Ore Deposition and Deep Mining. Waldemar Lindgren. A review of what has been accomplished in determining the mode of disposition of ores, and the probabilities of finding workable ores in depths. 5000 w. Ec Geol—Oct., 1905. No. 74591 D.

The Chemistry of Ore-Deposition—Precipitation of Copper by Natural Silicates. Eugene C. Sullivan. A report of experimental work. 2000 w. Ec Geol—Oct., 1905. No. 74593 D.

The Phase Rule and Conceptions of Igneous Magmas—Their Bearing on Ore Deposition. Thomas Thornton Read. Presents some considerations relating to rock magmas, and the laws which govern them, in relation to their bearing on the formation of ores. 6000 w. Ec Geol—Nov., 1905. No. 74594 D.

Block-Faulting, and Its Relation to Ore Deposition. Walter P. Jenney. An explanation of this singular type of fault-structure and the causes, and the ore deposits in association. 3200 w. Min & Sci Pr—Jan. 27, 1906. No. 74845.

The Genesis of Ore Deposits. C. O. G. Larcombe. Lecture before the Science Society of Sydney University, giving an explanation and comparison of recent theories. 4000 w. Aust Min Stand—March 10, 1906. Serial, 1st part. No. 75360 B.

Ore Deposits and Their Distribution in Depth. Prof. John W. Gregory. Delivered before the Royal Inst. of Gt. Britain. Discusses the past, present, and future ore supply of the world. 1300 w. Min Jour—May 5, 1906. Serial. 1st part. No. 76658 A.

The Practical Importance of Geology in the Study of Ore Deposits. John D. Irving. Aims to show that the geological relations of ore-deposits are the relations upon which the success of the metallurgical operations, the mining operations, and the accuracy of an estimate

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of the mineral wealth depend. 4000 w. Yale Sci M—June, 1906. No. 77371 C.

### Ore Dressing.

Removal of Wood in Ore Dressing. A. H. Wethey. Explains the trouble caused by the presence of wood, and illustrates and describes a wood-separating device, not patented. 1000 w. Eng & Min Jour—Oct. 20, 1906. No. 79879.

Ore Dressing by Flotation. An account of two recent papers before the Faraday Society. One by James Swinburne and Dr. G. Rudolf, and the other by Prof. A. K. Huntington. Discusses the successful application of this process to the treatment of tailings, its theory, &c. 4000 w. Elec. Chem & Met Ind—Feb., 1906. No. 74909 C.

### Ore Handling.

Underground Mechanical Transport in the Witwatersrand. An illustrated article describing methods of dealing with particular cases, and explaining the difficulties in the way of a complete solution. 2500 w. Engr., Lond—Feb. 2, 1906. No. 74998 A.

### Ore Loading.

Electrically Operated Ore Loading Plants and Wire Rope Tramways. Frank C. Perkins. Illustrates and describes some improved methods employed for ore loading, and the power utilized. 2000 w. Min & Sci Pr—Dec. 23, 1905. No. 74119.

### Ore Roasting.

The Use of Pyrometers in Ore-Roasting. William E. Greenawalt. Remarks on some of the conveniences in the use of these instruments, supplemented by experience and skill. 700 w. Eng & Min Jour—Aug. 4, 1906. No. 78435.

### Ore Thawing.

A New Ore Thawing Plant. Illustrated description of a new kiln thawing equipment for thawing cars of frozen ore. 1000 w. Eng Rec—Sept. 15, 1906. No. 79158.

### Ore Treatment.

Successful Treatment of Refractory Ores. Eric Hedburg. Explains the depreciation in value of ores containing zinc, iron, copper and nickel, the difficulty in separating, and the final discovery of a means of successfully treating them so as to recover all values. Ills. 1800 w. Min Wld—Feb. 10, 1906. No. 74965.

### Pay-Streaks.

Following the Pay Streak. R. B. Nickerson. Describes the experience of a mine superintendent, and the difficulties encountered. 2300 w. Min & Sci Pr—June 9, 1906. No. 77360.

### Perspective.

Perspective in Mining. J. Parke Chan-

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## Peru

ning. Address to the Engng. Soc. of Columbia Univ. Suggestions for young mining engineers. 4000 w. Min. Sci Pr—May 5, 1906. No. 76640.

## Peru.

The Mineral Resources of Peru. A. L. M. Gottschalk. Information concerning the variety of minerals of commercial value to be found. Alabaster, marble, cobalt, lead, mica, molybdenite, nickel, petroleum, salt, silver, gold, coal, etc. 3000 w. Min Wld—July 28, 1906. No. 78288.

## Philippinea.

Mining in the Philippines. Oscar Halvorsen Reinholt. An illustrated article reporting the present condition of the mining industry. Coal, gold and ores of iron and copper are the most important products. 1500 w. Min Wld—Jan. 27, 1906. No. 74782.

## Pneumatic Tools.

Air Hammer Rock Drills in Mining. Edward A. Rix. Read at convention of Cal. Miners' Assn. Gives the history of the introduction, and information in regard to its practical application and advantages. 6000 w. Compressed Air—Jan. 1906. No. 74793.

## Power Plants.

Notes on the Generation and Use of Power in Mining Plants (Beiträge zur Frage der Krafterzeugung und Kraftverwertung auf Bergwerken). H. Baum. Discussing the steam power plant at the mine and its applications to hoisting, pumping, ventilating, etc. Serial. Part I. 5000 w. Glückauf—Aug. 4, 1906. No. 78743 D.

The Main Power Plant and Hoisting Machine of the Wintershall Mine, Heringen-on-the-Werra (Die Primaranlagen und die HAUPTSCHACHT FÖRDER MASCHINE DER GEWERKSCHAFT WINTERSHALL, HERINGEN a.d. W.). H. Rosterg. Illustrating and describing the hydro-electric plant of 500 h.p. and the electric winding engine; the shaft is 441 metres deep. 5000 w. 1 plate. Glückauf—July 28, 1906. No. 78742 D.

## Prospecting.

Churn-Drill Prospecting. George C. McFarlane. Illustrates and describes a gas-pipe churn-drill, cutting a 2 or a 2½-in. hole, useful in prospecting to moderate depths, where the country rock is not especially hard. 2000 w. Eng & Min Jour—Nov. 18, 1905. No. 73239.

## Production.

The Mineral and Metal Production of the United States in 1905. General remarks with review of both non-metallic

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and metallic products. Table. 3000 w. Min Wld—Jan. 27, 1906. No. 74774.

## Pumping.

Electric Pumping at Collieries. Gerald Hooghwinkel. Abstract of a paper read before the Manchester Geol. & Min. Soc. Considers the types of pumps, the electric motors, efficiency, and electric sinking pumps. 4000 w. Col Guard—Nov. 17, 1905. No. 73481 A.

Mine Pumping by Compressed Air. A. M. Patterson, Jr. Abstract of a paper read at Pittsburg meeting of the Coal Mining Inst. of America. Brief discussion of the four approved methods of pumping with compressed air as applied to mine use. 2200 w. Min Wld—June 30, 1906. No. 77717.

The Electric Pumping Plant at the Wilhelmina Coal Mine at Heerlen, Holland (Die Elektrisch Betriebene Abteufanlage auf Grube Wilhelmina der Holländischen Staatsminen-Verwaltung bei Heerlen, Holland). W. Philippi. A very complete description of the use of high-speed centrifugal pumps driven by three-phase motors. 5000 w. Elektrotech Zeitschr—Aug. 30, 1906. No. 79356 B.

Triple-Expansion Pumping-Engine; Wilge River Station, South Africa. Illustrated description of machinery installed in the pumping station in connection with the working of the Premier diamond mines, near Pretoria, Transvaal. 600 w. Engng—Aug. 31, 1906. No. 79138 A.

## Pumps.

Compressed Air Pumps with Water-Heated Reheater. L. C. Bayles. Illustrates and describes an improvement made at the Givern mine, California. 500 w. Eng & Min Jour—April 21, 1906. No. 76161.

Electrical Mine Pumps at the Ward Shaft, Virginia City. Leon M. Hall. Brief illustrated description of probably the largest electrically-driven mine pump installation yet constructed. 1000 w. Eng Rec—Oct. 13, 1906. No. 79781.

## Pyrite.

A Noted Pyrite Deposit. W. H. Storms. An account of the occurrence of sulphide ore in Whizzers mine, at Deadwood, S. D. 1200 w. Min & Sci Pr—Oct. 28, 1905. No. 73050.

Davis Pyrites Mine, Massachusetts. J. J. Rutledge. Gives the location, physiography and geology of the region, describing the deposit and the methods of mining. Ills. 3800 w. Eng & Min Jour—Oct. 13, 1906. Serial. 1st part. No. 79774.

# MINING AND METALLURGY

## Quarries

### Quarries.

Wealth in Barre Granite. Alton D. Adams. An illustrated description of the large quarries at Barre, Vermont, and the methods of quarrying. 1700 w. *Mines & Min*—June, 1906. No. 77185 C.

### Rare Minerals.

Rare Minerals in 1905. Charles C. Schnatterbeck. Gives information concerning tungsten, molybdenum, vanadium, uranium, rutile, monazite, gadolinite, zirconia, tantalite, columbite, osmium, and lithium minerals. 2500 w. *Min Wld*—Jan. 27, 1906. No. 74779.

### Report.

Queensland Mines Inspection. Extracts from the inspectors report for 1905, giving information relating to the metalliferous mines, and the coal mines. 3500 w. *Queens Gov Min Jour*—June 15, 1906. No. 78379 B.

### Rescue Apparatus.

A New Respiratory Apparatus for Use in Fires and Mines. Illustrated description of the Chapin-Sherman apparatus. 1200 w. *Sci Am Sup*—Oct. 27, 1906. No. 80096.

A New Apparatus for Rescue Work in Mines. W. E. Garforth. Abstract of paper read before the Inst. of Min. Engrs. Discusses the requirements of rescue apparatus, and the efforts made to furnish such apparatus, the defects, etc., describing an apparatus designed by the writer. 2500 w. *Ir & Coal Trds Rev*—June 22, 1906. No. 77787 A.

The "Pneumatogen Rescue Apparatus for Mines. Richard Cramer. Illustrated description of this apparatus. The most essential part is a filter in which potassium-sodium peroxide constitutes the filtering material. 1400 w. *Ir & Coal Trds Rev*—July 6, 1906. No. 77992 A.

The Shamrock Rescue Apparatus at the Courrières Collieries. G. A. Meyer. Read before the Inst. of Min. Engrs. Reviews the development of portable apparatus for the breathing of oxygen, especially considering the latest results. Also editorial. Ills. *Min Jour*—June 23, 1906. Serial. 1st part. No. 77785 A.

### Respirators.

A New Respiration Apparatus. A brief description of the two present forms of the Bamberger-Böck pneumatogen. Ills. 1400 w. *Sci Am Sup*—Dec. 23, 1905. No. 73988.

Respiration Apparatus for Colliery Rescue Work. Profs. M. Bamberger, and F. Böck. Abridged translation from an article in *Glückauf*. Remarks on types of apparatus tried and their defects, with il-

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lustrated description of improved apparatus constructed by the authors. 3000 w. *Col Guard*—Feb. 2, 1906. Serial. 1st part. No. 74992 A.

The Chemistry and Mechanics of Respirator Life-Saving Appliances (Beiträge zur Chemie und Mechanik von Rettungsapparaten). M. Bamberger and F. Böck. A discussion of the reactions involved in the chemical regeneration of air for breathing, in connection with life-saving appliances for mines. 5000 w. *Glückauf*—May 12, 1906. No. 76826 D.

Modern Improvements in Life-Saving Apparatus (Bericht über Versuche mit Rettungsapparaten und über deren Vebesserungen). H. Grahn. An account of tests with artificial respiration apparatus at the Shamrock shaft of the Hibernia mine in Westphalia. 6000 w. *Glückauf*—May 26, 1906. No. 77629 B.

Respiratory Apparatus for the Exploration of Localities Filled with Irrespirable Gases (Appareil Respiratoire pour l'Exploration des Milieux Remplis de Gaz Irrésirable). M. Guglielminetti. A portable device, using caustic potash to absorb the carbonic acid from the expired air, the oxygen being supplied from a separate reservoir. 1200 w. *Comptes Rendus*—Jan. 2, 1906. No. 74639 D.

### Rhodesia.

Mining and Mineral Industry in Rhodesia. E. H. Garthwaite. An account of this interesting portion of S. Africa, its deposits of gold, copper, lead and zinc ores, the mines and mining laws, cost of supplies. 5200 w. *Min Mag*—Jan., 1906. No. 74345 C.

The Ancient Auriferous Conglomerates of Southern Rhodesia. J. W. Gregory. Discusses the genesis of the Rhodesian "banket," illustrating and describing samples taken. 6400 w. *Inst of Min & Met*—May 17, 1906. No. 77004 N.

### Roasting.

Lime Roasting of Nickeliferous Matte. A. C. de Jongh. An account of some experiments in working of nickel-copper matte. 700 w. *Eng & Min Jour*—April 28, 1906. No. 76396.

A Novel Furnace for Roasting Fine Ore. Dr. Alfred Gradenwitz. Illustrated description of a furnace designed by G. O. Peterson, of Finland, and of its operation. 700 w. *Ir Trd Rev*—July 19, 1906. No. 78050.

Theoretical Aspects of Lead-Ore Roasting. C. Guillemin. Abstract translation from *Metallurgie*. Refers to some new processes of lead-ore roasting. The methods of Antouin Germot and of



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## Rock Drills

Huntington and Heberlein. 2200 w. Eng & Min Jour—March 10, 1906. No. 75464.

The Conversion of Sulphide Ores to Sulphates by Roasting (Ueber Sulfatisierende Röstung der Sulfidischen Erze). Dr. Rudolf Vondracek. A study of the chemical reactions in the roasting of sulphide ores of various metals for the production of sulphates. 3000 w. Oesterr Zeitschr f Berg u Hüttenwesen—Aug. 25, 1906. No. 79339 D.

## Rock Drills.

Models of Rock Drills at South Kensington. Describes some interesting models of rock-drilling and boring machinery recently added. 1200 w. Engr, Lond—Aug. 31, 1906. No. 79148 A.

Improved Electric Rock Drills (Neuere Elektrische Stossbohrmaschinen). W. Wolf. Describing improved forms of solenoid rock drills, with details of construction. 2000 w. Oesterr Zeitschr f Berg u Hüttenwesen—Nov. 18, 1905. No. 73846 D.

Notes on the Construction and Practical Operation of Rock-Drilling Machines. Lengthy discussion of E. M. Weston's paper on this subject. 13000 w. Jour of Chem, Met & Min Soc of S Africa—Oct., 1905. No. 73968 E.

Air-Hammer Rock Drills. E. A. Rix. Read at Convention of California Miners' Assn. Describes a new type of rock drill for mining work, the kinds of work to which they are suited, and results. 5000 w. Mines & Min—April, 1906. No. 75967 C.

Electrically Driven Crank Impact Rock Drill (Elektrisch Angetriebene Kurbelstossbohrmaschinen). Josef Ksanda. Illustrations of the practical use of the Siemens-Schuckert electric rock drill in the Kaiser Franz Josef mine at Breth, Carinthia. Three articles. 1 plate. 6000 w. Oesterr Zeitschr f Berg u Hüttenwesen—July 21, 28, Aug. 4, 1906. No. 78738, each D.

A Carriage for Rock Drills. C. F. J. Galloway. Read before the South Wales Inst. of Engrs. An illustrated description of an application of the Brandt column, which is used in conjunction with drilling machines actuated by compressed air. 2500 w. Min Jour—April 28, 1906. Serial. 1st part. No. 76568 A.

## Rock Pressures.

Rock Pressures as the Cause of the Fall in the Příbram Mines (Spannungen im Gesteine als Ursache von Bergschlägen in den Příbramer Gruben). Hugo Stefan. Reviewing several falls of rock in the Příbram mines in Bohemia, prob-

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ably due to the pressure in the rock. 2000 w. Oesterr Zeitschr f Berg u Hüttenwesen—May 19, 1906. No. 77626 D.

## Safety.

Safety in Mining. Extracts from a paper by Messrs. Donald Macaulay and Lewis G. Irving, contributed to the Journal of the Chem., Met. & Min. Soc. of S. Africa. 8900 w. Can Min Rev—Sept., 1906. No. 79279 B.

## Safety Appliances.

The Undeutsch Safety Catch. Erminio Ferraris. Review of a book by Hermann Undeutsch, considering the rational construction of safety-catches on cages, and all matters relating to their efficiency and action. Ills. 3000 w. Eng & Min Jour—May 26, 1906. No. 76969.

Safety Appliances for Electrical Apparatus in Coal Mines. Editorial on the researches carried out in the Westphalian district of Germany showing that electric machinery can be rendered safe in fiery mines without undue complications and at reasonable cost. 3000 w. Engng—July 20, 1906. No. 78312 A.

A Critical Examination of the Action of Safety Catches (Kritische Besprechung Gefährlicher Fall und Fangergebnisse). H. Undeutsch. An examination of the construction of safety catches on mine hoists, with especial reference to the permissible amount of drop before seizure. Two articles. 5000 w. Oesterr Zeitschr f Berg u Hüttenwesen—March 3, 10, 1906. No. 75739 each D.

South African Rope and Safety-Catch Commission. Official report of tests made of Undeutsch's safety-catches, K. Schweder's safety-catch and further trial of J. A. Garvin's safety-catch. 800 w. Min Rept—Aug. 16, 1906. No. 78646.

The Nicholson Automatic Engine-Stop. R. H. Nicholson. Illustrates and describes a mechanical arrangement to prevent overwinding. 900 w. Eng & Min Jour—April 21, 1906. No. 76163.

## Safety Lamps.

Recent Experiments on Safety Lamps (Nouvelles Expériences sur les Lampes de Surété). H. Schmerber. Describing the appliances and results at the testing station at Frameries, Belgium. The lamps are exposed to explosive gases drawn from the mines. Two articles. 3000 w. Génie Civil—Oct. 21, 28, 1905. No. 73312 each D.

## Sampling.

Sampling with a Churn-Drill. Matt. W. Alderson. An illustrated article describing this method of sampling a large

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## Sand Pumping

surface showing. 1000 w. *Min Sci Pr*—May 19, 1906. No. 76982.

The Sampling of Ores Containing Metallics. Clarence C. Sample. Describes a method used in the west, but outside of the United States. 1500 w. *Eng & Min Jour*—Aug. 25, 1906. No. 78819.

## Sand Pumping.

A New Method of Pumping Sand by Means of Compressed Air at the Plant of the United States Silica Co. Lucius I. Wightman. Illustrated description of an installation at Ottawa, Ill., especially adapted for this work. 1200 w. *Eng News*—Dec. 7, 1905. No. 73622.

## Screening.

A Traveling-Belt Screen. Illustrated description of this machine explaining the fundamental principle. 1800 w. *Eng & Min Jour*—March 10, 1906. No. 75463.

## Separation.

The Separation of Iron from Zinc by Ammonia. Kurt Pietrusky. Gives report of experimental investigations, showing that satisfactory results can only be obtained when there is a large excess of ammonia in the solution. 1500 w. *Min & Sci Pr*—Feb. 3, 1906. No. 74969.

Magnetic Separation at Galena, Illinois. Describes a plant for the separation of low-grade zinc ores. 1000 w. *Eng & Min Jour*—Sept. 15, 1906. No. 79182.

## Separator.

A Simple Device for Separating Sands from Slimes. Courtenay de Kalb. Describes an unpatented device designed by the writer which has proved very efficient. 500 w. *Eng & Min Jour*—Aug. 4, 1906. No. 78439.

## Shafts.

Allan Shafts. H. S. Patterson. Illustrated description of the progress in sinking and the methods employed at two shafts of the Acadia Coal Company, Nova Scotia. 900 w. *Mines & Min*—March, 1906. No. 75451 C.

Improved Shaft Equipment. S. A. Worcester. Illustrates and describes an arrangement designed for handling ore at the Golden Cycle mine, Cripple Creek, Colo. It is claimed that it will save from \$8 to \$15 each 8-hour shift. 1500 w. *Min & Sci Pr*—March 17, 1906. No. 75672.

Sinking, Development and Underground Equipment of Deep Level Shafts on the Rand. Arthur E. Pettit. Read before the Inst. of Min. & Met. An illustrated description of methods of sinking and equipping shafts, with some figures relating to the cost. 4500 w. *Ir &*

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*Coal Trds Rev*—Feb. 23, 1906. Serial. 1st part. No. 73379 A.

Sinking Shafts for a Modern Colliery. Prof. F. W. Hardwick. The present lecture is confined to the sinking of shafts and the difficulties encountered. 10500 w. *Jr & Coal Trds Rev*—March 2, 1906. No. 75515 A.

Notes on the Sinking of a Deep-Level Shaft. F. W. Girdler-Brown. Gives figures covering the cost of a deep level shaft, briefly discussing the rationale of some of the methods employed. 4 schedules. 4800 w. *Jour S African Assn of Engrs*—Feb. 3, 1906. No. 75939 F.

Re-Sinking and Repairing a Collapsed Shaft. E. Nelson. Read before the Nat. Assn. of Colliery Mgrs. Illustrates and describes the methods employed to overcome the difficulties. 2000 w. *Ir & Coal Trds Rev*—March 30, 1906. No. 76020 A.

Noteworthy Shaft Sinking at Detroit. An account of conditions that made the work very difficult, and the final success in sinking a shaft, where for 20 years every attempt had proved a failure. 1200 w. *Ir Age*—Nov. 16, 1905. No. 73147.

Mine Surveying. C. A. S. Andrews. Read at meeting of the Queensland Inst. of Surveyors. Detailed description of the method the writer has found to be best for an underground survey. 2500 w. *Queens Gov Min Jour*—Sept. 15, 1905. Serial. 1st part. No. 72974 B.

Surveying Secondary Mine Openings. Floyd L. Burr. Read before the L. Sup. Min. Inst. A brief description of a method used by the writer, and as accurate as is necessary for the work for which it is used. 1000 w. *Eng & Min Jour*—Nov. 11, 1905. No. 73103.

Modern Methods in Shaft Sinking. James Tonge. An illustrated account of some recent improvements in shaft-sinking methods in Great Britain. 2500 w. *Mines & Min*—Dec., 1905. No. 73717 C.

Shaft Guides. Bergassessor Ackermann, in *Zeit. Berg-, Hütten- und Salinenwesen*. Gives experience gained with various kinds of shaft guides in the Breslau Mining District. Ills. 9000 w. *Col Guard*—Dec. 15, 1905. No. 74051 A.

Some Considerations in the Equipment of Incline Shafts. F. N. Hambly. Discusses the size and grade of shaft, head-gear bins, skips, tracks, and ore bins underground. 4000 w. *Jour S African Assn of Engrs*—Oct., 1905. No. 74039 L.

Shaft Sinking in Quicksand. George C. McFarlane. Illustrates and describes a shaft in Michigan as a fine example of the successful application of a steel shoe

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## Shafts

in sinking a rectangular shaft through a heavy bed of quicksand. 1200 w. *Eng & Min Jour*—Jan. 20, 1906. No. 74474.

Shaft Sinking Through Sand. T. H. Motttram. Abstract of a paper before the Mining Inst. of Scotland, describing the sinking of shafts through sand at Ardeer, Ayrshire, by the pneumatic process. 2800 w. *Col Guard*—Dec. 29, 1905. No. 74294 A.

Sinking by the Up-Over Method. William Belfitt. Explains the conditions and describes the method adopted. Ills. 1200 w. *Ir & Coal Trds Rev*—Dec. 22, 1905. No. 74160 A.

Steam Pipes in Shafts. R. D. O. Johnson. Illustrates and describes an arrangement used by the writer which overcame the usual difficulties and proved satisfactory. 1000 w. *Eng & Min Jour*—Jan. 27, 1906. No. 74728.

Gallows Frames for shafts. R. D. O. Johnson. Illustrates and describes a guded design erected by the writer, and also a proposed design of even greater economy in material. 500 w. *Eng & Min Jour*—Feb. 24, 1906. No. 75257.

Misplacement of Shafts. E. J. Dunn. Concerning the Bendigo field, and the survey being made which will be a valuable guide to the correct position of future shafts. 1000 w. *Aust Min Stand*—May 9, 1906. No. 77256 B.

Concrete Lining for Mine Shafts. Carl Henrich. Describes the writer's views of the easiest and best way of putting in the concrete, and gives a comparison of costs of concrete lining and timbering. 1700 w. *Min Wld*—July 28, 1906. No. 78286.

How Bodies Fall in Deep Vertical Shafts. F. W. McNair. An explanation of some of the causes that deviate a falling object from the vertical, and reporting an investigation made at No. 5 shaft in the Tamarack mine. 2000 w. *Min & Sci Pr*—July 14, 1906. No. 78099.

The Deepening of the Julins Shaft at the La Houve Mine in Lorraine (Das Abteufen des Schachtes Julius der Bergwerks-Aktiengesellschaft La Houve bei Kreuzwald in Lothringen). H. Wetter. Describing the application of the Kind-Chaudron method for sinking a shaft through sand, clay, and water-bearing strata. 2000 w. *Gluckauf*—June 23, 1906. No. 78153 D.

Drift-Mining by Shaft. D'Arcy Weatherbe. Explains the practice and reports examples of the work, and gives a sketch of the present work in progress in the Blue Ravine channel and the

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methods employed there in mining and gold recovery. 2300 w. *Min & Sci Pr*—July 28, 1906. Serial. 1st part. No. 78434.

Shaft Sinking. S. H. Dunshee. Suggestions of value in the sinking and construction of shafts, and of their operation. 2800 w. *Min Rept*—Sept. 20, 1906. No. 79417.

The Cementing of Shafts Sunk through Water Bearing Strata (La Cimentation Appliquée comme Moyen de Fonçage des Puits en Terrains Aquifères). H. Schmerber. An illustrated description of the method of pumping liquid cement behind the temporary lining, with details of actual shaft-sinking in France and Germany. Two articles. 4000 w. *Génie Civil*—Aug. 25, Sept. 1, 1906. No. 79319 each D.

An Elliptical Concrete Shaft Lining at Bridgeport, Pennsylvania. An illustrated article discussing the considerations affecting its choice, the construction and mine connections. 2500 w. *Mines & Min*—Oct., 1906. No. 79630 C.

Shaft-Sinking at the Wolverine Mine. W. R. Crane. Illustrates and describes details of a method of advancing a slope shaft without interfering with the regular mining operations. 1600 w. *Eng & Min Jour*—Oct. 20, 1906. No. 79878.

Shaft-Sinking With Small Machines. Arthur B. Foote. Brief illustrated description of methods used in sinking an incline-shaft for the North Star Mines Co. 800 w. *Min & Sci Pr*—Oct. 13, 1906. No. 80014.

Wet Sinking in Arizona. R. B. Brinsmade. An account of the heavy flows of water encountered, the methods of excavation, handling pumping and hoisting machinery. Ills. 3000 w. *Mines & Min*—Oct., 1906. No. 79627 C.

## Shaft Sinking.

Shaft-Sinking by the Freezing Process at Brzeszcze (Schachtarbeiten mittels des Gefrierverfahrens in Brzeszcze). Fr. Drobniak. Describing the successful sinking of a shaft through quicksand in the coal district of western Galicia. Three articles. 2 plates. 7500 w. *Oesterr Zeitschr f Berg u Hüttenwesen*—July 14, 21, 28, 1906. No. 78736, each D.

An account of Sinking and Tubbing at the Methley Junction Colliery, with a Description of a Cast Iron Dam to Resist an Outburst of Water. Isaac Hodges. Abstract of a paper read before the Midland Co.'s Inst. of Engrs. 3500 w. *Col Guard*—April 20, 1906. No. 76447 A.

## Shaft Sinking

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## Shaft Sinking

Applications of the Freezing Process to the Deepening of Two Shafts at Limburg, Holland (Die Anwendung des Gefrierverfahrens beim Abteufen zweier Schächte auf der Holländischen Staatsgrube B, in der Provinz Limburg). H. Joosten. Describing the successful sinking of shafts 120 meters deep through quicksand by the use of the freezing process. 4000 w. Glückauf—May 12, 1906. No. 76825 D.

Shaft Timbers. Thomas Varcoe. Illustrates and describes methods of framing shaft timbers and making splices in the wall plates for very long shafts. 700 w. Min Jour—May 12, 1906. No. 76760 A.

The Application of Direct Cementation in Shaft Sinking. C. Dinoire. Abstract of a paper read before the Société de l'Industrie Minérale. Reports the application of direct cementation to a shaft where the water flow caused difficulties. 3500 w. Min Jour—April 21, 1906. No. 76443 A.

Modern Methods in Shaft Sinking. James Tonge. Considers improvements for handling buckets, sinking with drums, coffering, and the freezing process. Ills. 2500 w. Mines & Min—Feb., 1906. Serial. 1st part. No. 74934 C.

## Shoots.

Ore Shoots. Walter Harvey Weed. Remarks on the importance to the mine operator of the localization of pay ore, giving examples showing the behavior of veins. Ills. 900 w. Eng & Min Jour—Aug. 4, 1906. No. 78437.

## Shot-Firing.

Safe Shot-Firing in Coal Mines. George G. André. Briefly considers the quantity of explosive used, slow firing, firing by electricity, &c. 1200 w. Col Guard—Dec. 15, 1905. No. 74050 A.

## Signals.

Electric-Optical, Acoustic Signals at the Julius III. Shaft at Brück (Elektrisch, Optisch, Akustische Seilbahn Signalanlage am k. k. Schachte Julius III. in Brück). Gustav Ryba. Describing a signal system for use in connection with an underground cable traction haulage installation. Two articles. 4000 w. 1 plate. Oesterr Zeitschr f Berg u Hüttenwesen—Nov. 18, 25, 1905. No. 73845 each D.

## Silesia.

Mining and Railway Development in Upper Silesia (Bergbau und Eisenbahnen in Oberschlesien). Ober-Baurat Nitschmann. With map of the coal district and a general railroad and mining map. Silesia is rich in coal, iron, lead zinc, and silver. Discussion. 3500 w.

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## Smelting

Glaser's Annalen—April 15, 1906. No. 76260 D.

## Sieves.

Sieve and Screen Apertures. George T. Holloway. Abstract from Bul. No. 5 of the Inst. of Min & Met. Gives tables showing the size of aperture obtainable with sieves of different mesh with wire of different gauge, and discusses the advisability of deciding upon some general standard. 1500 w. Min Wld—July 21, 1906. No. 78088.

## Sizing.

Screens for Sizing. Ernest A. Hersam. Gives tables of use in arranging a graded series of screens, following any mathematical law or the line of any curve, with remarks bearing on this subject. 7000 w. Bul Am Inst of Min Engrs—May, 1906. No. 77175 C.

## Sketching.

Sketching the Geological Features of a Mine. Prof. Arthur Lakes. Showing the value of sketches in giving a clear understanding of mine formations. 800 w. Mines & Min—Oct., 1906. No. 79631 C.

Mining Sketching. Prof. Arthur Lakes. Illustrates and describes methods of drawing various kinds of timbering and showing the appearance of different openings and passages underground. 1800 w. Mines & Min—July, 1906. No. 77910 C.

## Slipping Planes.

Slipping Planes in Mines. Arthur Lakes. Illustrates and describes peculiarities due to folding or faulting. 800 w. Min Rept—Jan. 4, 1906. No. 74237.

## Smelting.

A Combined Siphon-Spout and Matte-Trap. Henry Harris. Illustrated description of this design which has been used continuously for some months with pleasing results. 1000 w. Eng & Min Jour—Jan. 27, 1906. No. 74731.

Smelting Zinc Retort Residues. E. M. Johnson. Abstract of a paper in the *Western Chemist & Metallurgist*. A report of experimental work carried out in Kansas. 800 w. Eng & Min Jour—Feb. 17, 1906. No. 75037.

The Smelting Works of British Columbia. Notes on the changes and improvements made at the various smelters during the year 1905. Ills. 3000 w. B. C. Min Rec—Dec., 1905. Serial. 1st part. No. 74790 B.

The Imbert Process. E. Gibbon Spilbury. Describes a process for the extraction of certain metals from their sulphides. 1800 w. Min & Sci Pr—June 30, 1906. No. 77857.

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## Snowslides

Relations of Mining and Smelting between Mexico and the United States. Shows the changes which have taken place and causes of the enormous smelting industry which has been developed, discussing the future outlook. 1500 w. Min Rept—Aug. 9, 1906. No. 78506.

## Snowslides.

Snowslides in the Mining Districts of Idaho. Prof. Arthur Lakes. Discusses their causes and disastrous effects, and how to avoid them. Ills. 2000 w. Mines & Min—April, 1906. No. 75966 C.

The Effect of a Snowslide. Stephen L. Goodale. An illustrated account of the snowslide on March 17, 1906, which demolished a large portion of the stamp-mill of the Camp Bird, at Ouray, Colo. 700 w. Min & Sci Pr—April 14, 1906. No. 76178.

## Steam Shovel.

The Allis-Chalmers Steam Shovel. W. N. Tanner. Illustrates and describes a type found useful in mining operations. 1000 w. Eng & Min Jour—Feb. 3, 1906. No. 74837.

## Stopes.

Handling Ore in Stopes. D. T. Williams. Abstract of a paper in the *Jour. of the Transvaal Inst. of Mech. Engrs.* An explanation of the difficulties and description of the mechanical devices introduced. 2200 w. Eng & Min Jour—May 5, 1906. No. 76545.

The Detailed Mapping of Stopping Areas. H. R. Sleeman. Deals with the graphic representation, in their true dimensions, of blocked-out ore reserves, considering the question solely in regard to inclined reefs. 2500 w. Inst of Min & Met—Feb. 15, 1906. No. 76993 N.

## Surveying.

Anderson's Method for Passing a Survey Line Down a shaft. Describes the method, giving diagrams. 500 w. Min & Sci Pr—Feb. 3, 1906. No. 74966.

## Surveys.

A Quick Vertical-Shaft Survey. W. E. Downs. Explains a method long used by the writer in making quick and accurate surveys of various vertical shafts along the Mother Lode of California. 1000 w. Min & Sci Pr—Aug. 25, 1906. No. 78944.

Colliery Surveying and Office Methods. F. W. Parsons. This first of a series of articles considers methods of mine surveying in the United States. 2000 w. Eng & Min Jour—Sept. 8, 1906. Serial. 1st part. No. 79060.

## Switchgear.

Colliery and Mining Switchgear for High and Low Tension Alternating Cur-

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rent Service. A. M. Randolph. Describes a special line of switchgear and control apparatus for use in connection with mining operations. 1400 w. Elec Rev, Lond—Nov. 3, 1905. Serial. 1st part. No. 73128 A.

## Timbering.

Systematic Timbering at Emley Moor Collieries. H. Baddiley. Illustrates and describes an improved system of timbering with the view of diminishing accidents from falls of roof and sides. 1000 w. Eng & Min Jour—Feb. 17, 1906. No. 75039.

The Impregnation of Mining Timber (Ueber die Imprägnierung von Gruben-hölzern). F. Seidenschneur. Discussing the importance of using preservatives for wood used for timbering mines, with photographs showing the increase in durability. 1800 w. Glückauf—May 5, 1906. No. 76824 D.

Underground Timbering. R. B. Nickerson. Describes methods of timbering heavy mines, methods of taking the measures for timbers underground, etc. 2000 w. Min & Sci Pr—May 19, 1906. No. 76983.

An Improved Method of Framing Square Sets. A. A. Steel. Illustrates and describes a plan suggested by M. K. Orr. 900 w. Min & Sci Pr—Aug. 11, 1906. No. 78652.

Timbering in Swelling Ground. Claude T. Rice. Illustrates and describes briefly methods that have been tried for this kind of ground. 500 w. Eng & Min Jour—Aug. 18, 1906. No. 78636.

## Toggle Movement.

The Geometry of the Toggle Movement. R. W. Chapman. Explains the mechanical movement known as the pitman and toggle, and its application to the Wilfley table. 600 w. Aust Min Stand—July 18, 1906. No. 78662 B.

## Tonopah.

The Tonopah Volcanoes. Prof. Arthur Lakes. Discusses the causes to which are due the appearance of the country and also the ore deposits. 700 w. Mines & Min—July, 1906. No. 77908 C.

## Tracks.

Track Construction in Mines. Leo Gluck. Abstract of a paper read before the Illinois Soc. of Engrs. & Survs. Briefly considers the switches, gauge of tracks, frog angles, &c. 600 w. Eng News—Jan. 25, 1906. No. 74569.

## Transbaikalia.

Prospecting in Transbaikalia. R. Farina. Read before the Inst. of Min. & Met. Information concerning this region which has long been famous for its placer

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## Transvaal

gold mines. 1500 w. Engr, Lond—Sept. 21, 1906. No. 79593 A.

## Transvaal

Transvaal Mining in 1905. Ralph Stokes. An illustrated historical review of the mines and minerals of this district. 5000 w. Min Wld.—Jan. 27, 1906. No. 74780.

## Tropica.

Life and Mining in the Tropics. G. M. Colvocoresses. Considers the climate and its influence, and gives suggestions for keeping in good health. 3000 w. Eng & Min Jour—Dec. 23, 1905. No. 73993.

## Tube Mills.

Notes on Tube-Mills at El Oro, Mexico. Charles Butters. Notes on the operation of tube-mills at El Oro, with suggestions. 2000 w. Min & Sci Pr—May 26, 1906. No. 77093.

Tube-Mill Practice. W. R. Dowling. Discussing points of practical interest to those engaged in tube-mill work. Briefly describes the tube-mill equipment of the Robinson Deep G. M. Co. 5000 w. Jour Chem, Met, & Min Soc of S Africa—April, 1906. No. 77398 E.

## Tunnels.

A Colorado Mining Tunnel. Thomas Tonge. The conditions in Colorado are described, and the three tunnels now being driven are outlined, especially describing the Central Tunnel. 3000 w. Min Jour—Jan. 6, 1906. No. 74410 A.

Big Cross-Cut Tunnels of Clear Creek County, Colo. H. C. Newton. Extracts from a recent article by Gen. Frank Hall, describing briefly the Newhouse, Burns-Moore, Honest John, "Big 40," Central and Lucania, Gold Valley, Commodore, and Alvarado tunnels. 3000 w. Min Wld—Jan. 20, 1906. No. 74491.

The Lucania Tunnel. An illustrated account of this tunnel for the development of Colorado mines. 3000 w. Min Ind—Jan. 15, 1906. No. 74448.

The Newhouse Tunnel. An interesting illustrated account of this enterprise in Colorado, describing the property and the territory tributary to it. 2500 w. Min Ind—Jan. 15, 1906. No. 74447.

The Newhouse Tunnel. George W. Dutton. A description, with illustrations, and general information concerning this work. 1600 w. Min Wld—April 21, 1906. No. 76180.

The Newhouse Tunnel at Idaho Springs, Colorado. G. C. Ripley, J. G. Gordon, Jr., W. H. Freeland, Jr., and W. H. Finnigan. Abstract from a graduating thesis. Describes the methods of driving, haulage, drainage, ventila-

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tion and costs. Ills. 3000 w. Mines & Min—Aug., 1906. Serial. 1st part. No. 78491 C.

## Turkey.

Mining in Turkey. B. Nogara. An illustrated description of the conditions of mining in the Turkish Empire. 1400 w. Min Mag—Jan., 1906. No. 74346 C.

Coal, Iron Ore, and Manganese in Asiatic Turkey. Bruno Simmersbach in *Zeitschrift für Berg-Gruben-und Salinenwesen*. Information concerning the deposits and the development of this region. 2000 w. Ir & Coal Trds Rev—July 6, 1906. No. 77991 A.

## Unwatering.

Unwatering of the Achddu Colliery. John Morris. Abstract of a paper read before the Inst. of Min. & Met. Gives an account of the work, describing the pumps used and stating the difficulties. 3000 w. Min Jour—Nov. 11, 1905. No. 73284 A.

Unwatering the Hamilton Mine. John T. Jones. Read before the L. Sup. Min. Inst. An interesting account of the work of unwatering the mines at Iron Mountain, Mich. 1200 w. Eng & Min Jour—Nov. 11, 1905. No. 73104.

## Utah.

Mineral Resources of Uintah Reservation. William S. Smith. Information concerning the deposits of this region in Utah. Copper, silver and lead and valuable deposits of the hydrocarbons. Map. 1000 w. Min Wld—Nov. 4, 1905. No. 73043.

Mining Progress in Utah in 1905. L. H. Beason. A review of the year, showing increase in output in gold, silver and copper, especially the latter. 4000 w. Eng & Min Jour—Jan. 6, 1906. No. 74259.

## Valuation.

The Valuation of Mineral Properties. T. A. O'Donahue. A discussion of the conditions which differ from the valuation of other properties, giving formula deduced to comply with these conditions. 2500 w. Col Guard—Feb. 9, 1906. No. 75078 A.

## Veins.

The Origin of Vein-Filled Openings in Southeastern Alaska. Arthur C. Spencer. To account for certain features observed in the Juneau gold-belt in Alaska, the paper indicates in detail certain conditions in which deformation of rocks under their own weight might lead to the production of fractures in which veins could be deposited. Ills. 1500 w. Am Inst of Min Engrs—Nov., 1905. No. 73958.

# MINING AND METALLURGY

## Veins

**Fissure-Veins.** R. W. Raymond. A contribution to a discussion of the question, What is a fissure-vein? 1200 w. *Eng & Min Jour*—Nov. 25, 1905. No. 73446.

**Ore-Horizons in the Veins of the San Juan Mountains, Colorado.** Chester Wells Purington. Considers an occurrence in southwest Colorado, where nearly vertical metalliferous veins traverse horizontally bedded lavas and underlying sediments. 1800 w. *Ec Geol*—Nov., 1905. No. 74596 D.

**The Problem of the Metalliferous Veins.** James Furman Kemp. Presidential address to the N. Y. Academy of Sciences. An interesting discussion of metalliferous deposits, their origin, and matters of related interest. 8500 w. *Ec Geol*—Dec., 1905. No. 74705 D.

**The Evolution of a Mineral Vein.** Arthur Lakes. An illustrated description of a mineral vein showing its geological features. 700 w. *Min & Sci Pr*—May 26, 1906. No. 77096.

**Thermal Activity in Its Relation to the Genesis of Certain Metalliferous Veins.** Prof. James Park. Considers effects due to thermal solutions aided by steam and gases. 3300 w. *N Z Mines Rec*—July 16, 1906. Serial. 1st part. No. 78986 B.

## Ventilation.

**Ventilation and Sanitation of Mines.** Extracts from the report of the West Australian Royal Commission on the use of compressed air for ventilating purposes. 3500 w. *Queens Gov Min Jour*—April 18, 1906. No. 76986 B.

**Some Examples of Modern Mine Ventilation.** Describes the various methods now being employed in some of the northern counties of England and gives facts concerning the ventilating plants installed. Ills. 2500 w. *Ir & Coal Trds Rev*—June 8, 1906. No. 77395 A.

**Mechanical Mine Ventilation.** J. R. Robinson. Read before the Coal Min. Inst. of America. A comparison of various types of fans, the Guibal, Screw Propeller, "Sirocco," Capell, and Robinson. 4000 w. *Mines & Min*—Feb., 1906. No. 74933 C.

## Virginia.

**Mining of Zinc, Lead, Iron, and Coal in Virginia.** Thomas L. Watson. A review of the mineral industry in the State, the production, new developments, &c. 4800 w. *Eng & Min Jour*—Jan. 6, 1906. No. 74260.

## Washington.

**Coal, Iron and Metalliferous Resources of Kittitas County, Washington.**

## MINING

## Winding

Gives information from the reports of the U. S. Geological Survey. 1800 w. *Min Rept*—Sept. 6, 1906. No. 79066.

## Water Supplies.

**The Importance of Potable Water Supplies to Mining Communities.** Charles E. Morrison. Discusses the usual sources of supply for mining camps, and the dangers of some of them. 1500 w. *Eng & Min Jour*—Dec. 9, 1905. No. 73642.

**The Savage River Pumping Plant.** Illustrates and describes a plant built to furnish water for a coal mine near Frostburg, Md. 1500 w. *Eng & Min Jour*—Sept. 29, 1906. No. 79551.

## Winding.

**A Controlling Device.** Illustrated description of Nicholson's controlling device for automatically stopping a steam hoisting engine when the cage passes a given point. 1400 w. *Mines & Min*—Jan., 1906. No. 74248 C.

**Electric Winding Considered Practically and Commercially.** W. C. Mountain. Abstracts of a paper read before the Manchester Soc. of the Inst. of Elec. Engrs. A tabulated statement of the actual cost of winding by steam engines at large collieries is given, and relative estimates of the cost of winding by steam and electricity. 4000 w. *Ir & Coal Trds Rev*—Jan. 19, 1906. No. 74759 A.

**Electric Winding in Main Shafts Considered Practically and Commercially.** W. C. Mountain. Abstract of a paper read before the Manchester Sec. of the Inst. of Elec. Engrs. Briefly considers the systems of winding, especially from a commercial standpoint. Does not favor electricity for heavy winding. 2500 w. *Col Guard*—Feb. 23, 1906. No. 75371 A.

**Weight in Winding Drums.** R. H. Collingham. Considers the weight of a conical drum with regard to the weight of a parallel drum of the same maximum diameter. Gives method used by writer. 1800 w. *Engr, Lond*—Feb. 23, 1906. No. 75376 A.

**Electric Main Winding Plant for a Shale Mine.** Illustrated description of a plant at Cobbinshaw pit, about 15 miles from Edinburgh. 2000 w. *Engng*—March 30, 1906. No. 76014 A.

**Electric Winding Considered Practically and Commercially.** Gerald Hoogwink. Abstract of a paper read before the Newcastle Sec. of the Inst. of Elec. Engrs. A contribution to the discussion of the paper by W. C. Mountain. Also general discussion. 6000 w. *Col Guard*—

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## Winding

March 23, 1906. Serial. 1st part. No. 75903 A.

Over-Winding in Hoisting Operations. Robert Peele. Explains the dangers from over-winding, and discusses the various devices which have been introduced to prevent fatal consequences. Ills. 3800 w. Sch of Mines Rev—Jan., 1906. No. 76385 D.

The Development of Hoisting Appliances (Entwicklung der Aufsetzvornichtungen). Karl Teiwes. Discussing especially the appliances used in connection with mine hoists for controlling the exact landing position of the cage or platform. 6000 w. Glückauf—March 31, 1906. No. 76240 D.

Winding Ropes. Editorial considering some of the inquiries in regard to winding ropes made by a Commission appointed by the Transvaal Government to report on the question of safety of persons traveling in shafts. 6800 w. Min Jour—March 24, 1906. No. 75906 A.

85-Horse-Power Electric Winding Engine. Illustrates and describes an engine built for the Lens Colliery Company, in France. 1200 w. Engng—May 18, 1906. No. 77015 A.

Electric Winding. W. C. Mountain. A reply to published discussions and conclusions on a recent paper by the writer dealing with this subject. 1500 w. Ir & Coal Trds Rev—April 27, 1906. No. 76584 A.

Commercial Possibilities of Electric Winding for Main Shafts and Auxiliary Work. W. C. Mountain. Read before the British Inst. of Min. Engrs. Gives tables showing the actual cost of winding by steam engines, and by electricity, and much information. 6800 w. Ir & Coal Trds Rev—June 15, 1906. No. 77490 A.

Electric Hoisting at the Noel-Sart-Culpart Collieries. Alfred Gradenwitz. Illustrated description of the plant installed in these mines in Belgium. 2000 w. Eng & Min Jour—June 9, 1906. No. 77199.

Steam Hoisting Engines (Ueber Dampf förder maschinen). Data and results of tests on hoisting engines, with indicator and load diagrams. 4000 w. Glückauf—May 19, 1906. No. 77628 B.

The Failure of Winding Ropes. E. King. An illustrated description of the "Kilindo" rope construction, and remarks on its wearing qualities. 1000 w. Min Jour—May 26, 1906. No. 77132 A.

## MINING

## Working Costs

Duplex Tandem Winding-Engine. Illustrated description of a large horizontal duplex tandem winding engine made at Erith, stating the conditions it was constructed to fulfil. 2200 w. Engng—July 20, 1906. No. 78310 A.

Mine Winding-Engines. Illustrates and describes the important features of three different types of winding engines showing present practice. 2000 w. Engng—June 22, 1906. No. 77793 A.

The Westinghouse Converter Equalizer System for Variable Loads (Winding motors, rolling mills, etc.). Briefly describes and illustrates this system. 2000 w. Ir & Coal Trds Rev—June 22, 1906. No. 77792 A.

Electric Winding Engines. Paul Habets, in a communication to the *Société de l'Industrie Minérale*, gives results obtained from the use of electricity for winding on the Continent. 3500 w. Col Guard—Sept. 28, 1906. No. 79702 A.

The Siemens-Ilgner System of Electrical Mining Hoists. J. W. H. Hamilton. Illustrated detailed description of this system which is characterized by the fly-wheel converter. 2500 w. Eng & Min Jour—Sept. 29, 1906. No. 79550.

The Steam Consumption of Modern Winding Engines. Describes a cross-compound Corliss winding engine at a colliery in Nottinghamshire, calculating its steam consumption. 1800 w. Engr,

New Winding Engine at the Sacré Madame Mines, Belgium (Nouvelle Machine d'Extraction à Vapeur des Charbonnages de Sacré-Madame, Belgique). L. Ramakers. Illustrating a double horizontal winding engine shown at the Liège exposition. 1500 w. 1 plate. Génie Civil—Nov. 11, 1905. No. 73318 D.

## Wisconsin.

Structural Relations of the Wisconsin Zinc and Lead Deposits. Ulysses Sherman Grant. Presents results due to detailed mapping of selected areas of this field. Describes the geology, the ore-deposits, and discusses their origin. 2200 w. Ec Geol—Dec., 1905. No. 74706 D.

## Working Costs.

The Distribution of Power on Mines. C. E. Hutton. Describes the method of power account apportionment adopted at the Van Ryn mines. Tables and discussion. 7500 w. Jour S African Assn of Engrs—Nov., 1905. No. 74393 F.



# MINING AND METALLURGY

## MISCELLANY

### Analysis

#### Analysis.

A System of Qualitative Analysis for the Common Elements. Arthur A. Noyes and William C. Bray. Gives an outline of the investigation, describing in detail the procedures, explaining the preparation of the solution, and the analysis of silver, copper, and tin groups. 41000 w. Tech Qr—Sept., 1906. No. 80000 E.

#### Antimony.

The West Gore Antimony Deposits. Alex. McNeil. Information concerning this mine in Nova Scotia, its history and development. The deposits are antimony-gold ore. 1500 w. Can Min Rev—Feb. 1906. No. 75225 B.

#### Arizona.

Sketch of the Geology and Ore Deposits of the Cherry Creek District, Arizona. John A. Reid. Considers the location, topography and geology of this interesting region, and the peculiar ore deposition. 6500 w. Ec Geol—March, 1906. No. 76944 D.

#### Asbestos.

Asbestos in Canada. Abstract of a monograph recently published by the Mines Bureau of the Dominion, giving information concerning the valuable deposits in Quebec. Ills. 1400 w. Eng & Min Jour—Nov. 18, 1905. No. 73241.

Concerning Asbestos. George P. Merrill. Gives a brief resume of the physical and chemical properties of the four varieties of asbestos on the market, the localities and mode of occurrence. 1500 w. Min Wld—March 24, 1906. No. 75676.

The Mining Manufacture and Uses of Asbestos. J. Alfred Fisher. An illustrated article giving information concerning this mineral, especially its use as a covering for boilers, pipes, etc. 3700 w. Tram & Ry Wld—May 11, 1906. No. 76928 B.

#### Asphalt Veins.

The Formation of Asphalt Veins. George Homans Eldridge. The distribution, nature and origin of the fissures, dimensions of the veins, and relation to the enclosing strata are considered; comparison with metalliferous veins; the origin of the material, and the manner of its introduction. 3000 w. Ec Geol—March, 1906. No. 76945 D.

#### Barite.

A New and Large Deposit of Barite in Idaho. Arthur Lakes. Describes this deposit in the Wood River region, and gives some of the uses and properties of barite and informaton relating to it. 1200 w. Min Rept—Aug. 16, 1906. No. 78648.

### Distillation

#### Bismuth.

The Assaying of Bismuth. E. P. Dunn. A proposed new method is described. 2500 w. Aust Min Stand—June 20, 1906. No. 78400 B.

#### Borax.

The Borax Deposits of California. G. E. Bailey. Illustrates and describes these deposits and their development. 1200 w. Min Wld—Jan. 6, 1906. No. 74231.

Borax Mining in California. Day Allen Willey. Describes the surface mining in the Mojave desert, and its replacement by underground mining, the methods used and the treatment. Ills. 800 w. Eng & Min Jour—Oct. 6, 1906. No. 79662.

#### Clays.

The Clays of Texas. Heinrich Ries. Gives facts concerning these deposits, their geology, classification, physical and chemical tests, and the industry generally. Map and Ills. 1500 w. Bul Am Inst of Min Engrs—Sept., 1906. No. 79853 D.

#### Coal-Dust Firing.

Coal-Dust Firing of Reverberatory Matt Furnaces. B. Severin. Sørensen. Notes on some experiments made at Murray, Utah, which gave results considered satisfactory. Ills. 1500 w. Eng & Min Jour—Feb. 10, 1906. No. 74944.

#### Congress.

Metallurgy at the Congress of Applied Chemistry at Rome (La Métallurgie au Congrès de Chimie Appliquée de Rome). Léon Guillet. Abstracts of the reports from various countries, including the alloys of iron and of copper, and a brief note on miscellaneous products. Two articles. 4000 w. Génie Civil—Aug. 18, 25, 1906. No. 79317 each D.

#### Diamonds.

Diamond Industry at Brazil. Arthur de Belmont. Information concerning the localities where diamonds are found, their size, value, and the associated minerals. Ills. 1000 w. Min Wld—May 5, 1906. No. 76542.

The Diamond Mines of South Africa. Gardiner F. Williams. An interesting illustrated account of these mines, the miners, methods, etc. 3500 w. Nat Geog Mag—June, 1906. No. 77373 C.

Diamonds and Carbons in Brazil. H. W. Furniss. Briefly reviews the history of the diamond industry in Brazil, giving information concerning the stones found; and also interesting facts concerning the carbons used for diamond drills, the methods of mining, etc. Ills. 2500 w. Pop Sci M—Sept., 1906. No. 78870 C.

#### Distillation.

The Boiling and Distillation of Nickel

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## Fluorspar

Iron, Manganese, Chromium, Molybdenum, Tungsten and Uranium (Sur l'Ebullition et la Distillation du Nickel, du Fer, du Manganèse, du Chrome, du Molybdène, du Tungstène, et de l'Uranium). Henri Moissan. A study of the behaviour of the metals of the iron group in the electric furnace. 3500 w. *Comptes Rendus*—Feb. 19, 1906. No. 75720 D.

## Fluorspar.

Fluorspar. E. Julius Fohs. A review of the production during 1905, giving information of the different districts, methods of mining, uses, &c. 2300 w. *Eng & Min Jour*—Jan. 6, 1906. No. 74269.

## Furnaces.

Heat Insulation. R. S. Hutton and J. R. Beard. Describes experiments to determine the relative value of heat-insulating materials used for the bricks or linings of furnaces. Diagrams. 1700 w. *Eng Rec*—Nov. 25, 1905. No. 73494.

## Gems.

The Gems of Ceylon, Their Form of Occurrence and Methods of Extraction. Ralph Stokes. An interesting account of this industry, describing the deposits, and the methods. Ills. 3000 w. *Min Wld*—April 28, 1906. No. 76408.

## Graphite.

Graphite—Its Occurrence and Uses. Charles C. Schnatterbeck. Discusses the occurrence, mining and refining, uses and values of this mineral. 1800 w. *Min Wld*—May 12, 1906. No. 76642.

Occurrence and Uses of Graphite. George Otis Smith. Describes the three general types of occurrence, and indicates the various uses which make it of industrial value. 1600 w. *Min Rept*—Oct. 18, 1906. No. 80025.

## Lead.

Lead Smelting in Reverberatory Furnaces at Desloge, Mo. W. R. Ingalls. Describes the technical results of furnaces of the Flintshire type at Desloge. 2200 w. *Eng & Min Jour*—Dec. 16, 1905. No. 73772.

The Savelsberg Process. W. R. Ingalls. Outlines this process for the desulphurization of galena by lime-roasting. 2200 w. *Eng & Mn Jour*—Dec. 9, 1905. No. 73645.

Methods for the Fire Assay of Lead. Oscar J. Frost. From *Jour. W. Assn. of Tech. Chem. Met.* Describes an operation applicable to a comparatively long fusion with gradually rising temperature. 3000 w. *Min Wld*—Feb. 17, 1906. No. 75051.

## MISCELLANY

## Manganese

An Unique Lead Deposit. R. D. O. Johnson. Describes a deposit in Missouri, a mineralized clay bed, and the method of mining. 1200 w. *Eng & Min Jour*—April 28, 1906. No. 76397.

Visit to a Cornish Lead Mine and Experiences with a Man Engine. A. Lakes. Describes an unusual method of raising and lowering the men in the mines. 700 w. *Min Rept*—May 3, 1906. No. 76539.

An Ontario Lead Deposit. J. Volney Lewis. Describes a galena-calcite vein in siliceous schist in central Hastings County, Ontario, Canada. 1500 w. *Ec Geol*—July, 1906. No. 79841 D.

## Lead and Zinc.

Mississippi Valley Lead and Zinc District. Ralph E. Davis. Describes the deposits in Wisconsin, Illinois, and Iowa, the geology, origin of the ores etc. Ills. 3000 w. *Min Wld*—May 5, 1906. No. 76540.

Lead and Zinc Deposits of the Virginia-Tennessee Region. Thomas Leonard Watson. A summary of the results obtained from a study of the geology of the ore-deposits of this district. 13800 w. Ills. *Bul Am Inst of Min Engrs*—March, 1906. No. 76117 D.

The Wisconsin Lead and Zinc District. An illustrated description and historical review of this district. 2500 w. *Eng & Min Jour*—June 23, 1906. No. 77456.

## Lead Smelting.

Present Position of Lead Smelting in Germany. F. T. Havard. A report of the condition of this industry, the production of lead, litharge, and silver, the processes used, working costs, etc. 2200 w. *Eng & Min Jour*—Aug. 25, 1906. No. 78812.

## Lead and Tin.

Lead and Tin in 1905. E. A. Caswell. A review of the markets and the causes affecting them. 2800 w. *Ir Age*—Jan. 4, 1906. No. 74217.

## Manganese.

The Principal Manganese Deposits of the World (Les Principaux Gisements de Manganèse du Globe). Ch. Dantin. A review of the manganese deposits in various parts of the world, with the constitution of the minerals and estimates of the quantities. 2000 w. *Génie Civil*—March 24, 1906. No. 76215 D.

Manganese Mining Industry in India. L. Leigh Fermor. Reviews the history of this industry, the mining methods, cost of transport and production, and the future prospects. Ills. 3800 w. *Ir & Coal Trds Rev*—Oct. 19, 1906. No. 80148 A.

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## Metals

### Metals.

The Metals in Human Progress. Nelson P. Hulst. An interesting study of the use of metals as influencing the progress of civilization. 3000 w. Sci Am Sup—June 16, 1906. Serial. 1st part. No. 77289.

### Metallography.

Cooling Curves of Metallic Solutions. Thomas T. Read. Considers the causes of points of inflection in a cooling curve. 1000 w. Ir & St Mag—Feb., 1906. No. 75096 D.

### Metallurgy.

Experiments on the Metallurgical Behavior of a Mixture of Lead Sulphide and Calcium Sulphate. F. O. Doeltz. Reports the experiments and gives the conclusion reached. 1600 w. Eng & Min Jour—Jan. 27, 1906. No. 74729.

The New Metallurgy. G. A. Denny and H. S. Denny. Considers the metallurgical question of the Witwatersrand, discussing the results obtained at the New Goch and the Meyer & Charlton mines, where the new departures have been put into practice. 5500 w. Min Jour—May 19, 1906. No. 77011 A.

Unsolved Problems in Metallurgy. Robert Abbott Hadfield. The Inst. of Civ. Engrs.—14th "James Forrest Lecture." Deals chiefly with iron and its alloys. 2500 w. Engr, Lond—May 4, 1906. Serial. 1st part. No. 76665 A.

### Mica.

India Mica Industry. Ralph Stokes. An illustrated account of the Madras or Nellore mica field and its development. 2500 w. Min Wld—May 19, 1906. No. 76719.

### Mineral Earths.

Mineral Earths in South Dakota. Denis Henault. Concerning these deposits, especially of fuller's earth and volcanic ash. Min Rept—June 7, 1906. No. 77210.

### Mineral Industry.

See Industrial Economy.

### Molybdenum.

Molybdenum. E. C. Andrews. Describing the ores of this metal, the methods of concentration, etc. 1500 w. Ir & Coal Trds Rev—Aug 10, 1906. No. 78681 A.

Molybdenum. E. C. Andrews. Describes the ores of molybdenum, its preparation, methods of concentration, etc., with suggestions to prospectors. 3000 w. Aust Min Stand—June 27, 1906. Serial. 1st part. No. 78403 B.

### Monazite.

Monazite Sand. C. Richard Böhm. Abstract of a paper in *Chemische Industrie*. Where known deposits are located, the

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## Phosphate

method of working, exploitation, etc. 1200 w. Eng & Min Jour—May 5, 1906. No. 76543.

### Natural Gas.

The Transportation of Natural Gas. D. S. Perry. Illustrates and describes the feeders from the largest gas well, in West Virginia, and the great gas engines at Hastings. 1200 w. Power—Dec., 1905. No. 73701 C.

### Nigeria.

The Mineral Survey of Nigeria. Information from the reports by Prof. Dunstan, on The Mineral Survey of Nigeria. The minerals found are given. 1200 w. Engr, Lond—May 11, 1906. No. 76766 A.

### Oil.

The California Oil Fields and Oil Fuel for Locomotives. D. A. Willey. An illustrated account of the development of this field, and the substitution of oil for solid fuel on locomotives, with results. 1200 w. Ry Age—Feb. 23, 1906. No. 75250.

### Ores.

Sedi-Genetic and Ignes-Genetic Ores. H. Foster Bain. An investigation aiming to obtain a quantitative estimate of the relative importance in ore production of certain major groups of processes. 2800 w. Ec Geol—Feb., 1906. No. 75841 D.

### Petroleum.

The Oil Fields of the West. Day Allen Willey. An illustrated account of the development of the oil-bearing sands west of the Mississippi River. 1800 w. Sci Am—Dec. 16, 1905. No. 73726.

Oil and Gas Development in the Mid-Continental Field in 1905. Erasmus Haworth. Reports concerning the Kansas-Indian Territory field, the development, refineries, pipe lines, &c. 6000 w. Eng & Min Jour—Jan. 13, 1906. No. 74383.

Oil Conditions in California. A statement of present conditions in the different fields. 1800 w. Am Gas Lgt Jour—Jan. 22, 1906. No. 74482.

The Boulder Oil Fields. A. Lakes. Describes this field explaining why this small area is productive, while the same shales at other points never yield a commercial amount. 1200 w. Min Rept—March 29, 1906. No. 75870.

Petroleum in Japan. I. A. Stigand. A review of the oil industry, the oilfields, geology, etc. Ills. 2000 w. Jour Soc of Arts—Aug. 10, 1906. No. 79127 A.

### Phosphate.

Florida Pebble-Phosphate Mining. John Bannon. Describes the processes and methods of the phosphate mining indus-

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## Platinum

try. 2500 w. Mfrs Rec—May 3, 1906. Serial. 1st part. No. 76480.

## Platinum.

Assay of the Platinum Metals. From *Oest. Zeit. f. Berg- und Huttenwesen*. A description, by Dr. Nordenskjold, of some analyses which do not appear to be well known, and which are more rapid than any milling practice. 3500 w. Eng & Min Jour—Dec. 2, 1905. No. 73536.

Researches on Metals of Platinum Groups. Prof. Henri Moissan. Paper read at Académie des Sciences. Gives experiments made with the ordinary form of Moissan furnace. 1500 w. Sci Am Sup—March 31, 1906. No. 75830.

The Best Riffle for Platinum. Dennis H. Stovall. Considers the best riffle for the tailing-flume is steel strapped scantlings. 800 w. Min & Sci Pr—April 7, 1906. No. 76059.

How to Pan Platinum. Dennis H. Stovall. Suggestions from the experience of W. J. Wimer. 700 w. Min Wld—April 28, 1906. No. 76409.

The Production of Platinum in 1905. F. W. Horton. From Adv. Sheets, Mineral Resources of the U. S. An explanation of the rise in price of platinum, and its increased production in the United States, where it is found. 1000 w. Min Rept—Oct. 25, 1906. No. 80120.

## Progress.

Recent Progress in Metallurgy. A. E. Outerbridge, Jr. Address, reviewing briefly the field covered by the metallurgical industries and the progress during the past year. 7500 w. Jour Fr Inst—Dec., 1905. No. 73932 D.

## Quicksilver.

The Mercury Mining District of Monte Amiata, Italy. Vincenzo Spirek. Gives the location and describes the deposits, method of working, production, treatment, etc. Ills. 5000 w. Min Mag—April, 1906. No. 76040 C.

California Quicksilver. Charles G. Yale. Reports affairs in this industry to be in a rather bad state, discussing some of the causes. 1500 w. Eng & Min Jour—Jan. 6, 1906. No. 74270.

The Quicksilver Deposits of Brewster County, Texas. William Battle Philips. Gives an illustrated general description and detailed description of the Terlingua district and the Study Butte district. 2600 w. Ec Geol—Nov., 1905. No. 74599 D.

The Terlingua Quicksilver Deposits. H. W. Turner. Describes the general geology of the district, the deposits in the tertiary lavas, and in sedimentary rocks, and the minerals of the quicksilver lodes.

## MISCELLANY

## Tin

Ills. 5000 w. Ec Geol—Dec., 1905. No. 74708 D.

California Quicksilver Industry. Clarence E. Edwards. Historical review of the development and production. Ills. 1600 w. Min Wld—Feb. 24, 1906. No. 75253.

The Mercury Deposits of Mexico. F. J. H. Merrill. Information concerning these deposits, their development and value. 2000 w. Min Wld—Feb. 17, 1906. No. 75049.

The Reduction of Quicksilver. From Adv. Sheets from Mineral Resources of the U. S. Explains the methods of extraction in use. 1500 w. Min Rept—Aug. 30, 1906. No. 78943.

## Salt Mining.

Underground Workings in Potash Salt Mines of Great Depths (Ueber den Abbau von Kalisalzlagernstätten in Grösseren Teufen). H. Kegel. Discussing especially the necessity for effective supports, in view of the difficult nature of the material. 3000 w. Glückauf—Oct. 6, 1906. No. 79937 B.

## Separation.

The Present Status of the Separation of Zinc Blende in Copper and Lead Ores. R. C. Canby. A review of the processes and devices used, and the advance made. 2200 w. Min Mag—June, 1906. No. 77329 C.

## Solutions.

Solutions of Solids and Solid Solutions. J. H. Stansbie. Abstract of paper read before the Met. Soc. at the Birmingham, Eng., Munic. Tech. School. A study of the changes which refer to the solid and liquid states of metals. 2500 w. Mech Engr—Nov. 18, 1905. No. 73454 A.

## Sulphur.

Determination of Sulphur in Pyrites. C. R. Gysander, in *Chemical News*. Describes the hydroxylamine method, and compares the results obtained with the Lunge method. 100 w. Min Rept—June 14, 1906. No. 77357.

## Talc.

Talc in Northern New York. Robert B. Brinsmade. An illustrated description of the deposits of the Talcville region, discussing their origin, and the mining and milling practice. 3500 w. Eng & Min Jour—Dec. 23, 1905. No. 74994.

## Tin.

The Tin Industry in 1905. A review of production and prices, and matters of interest relating to this industry. 2000 w. Min Wld—Jan. 27, 1906. No. 74778.

Tin Mining and Milling in Tringganu. C. C. Warnford Lock. An illustrated ac-

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## Tin

count of the tin mining of Malay peninsula describing the geology of the region, the tin deposits, etc. 1400 w. *Min Mag*—April, 1906. No. 76041 C.

Tin. The Famine in Tin. Editorial discussion of the increase in price, and the falling off of the supply, and the future outlook, mining localities, etc. 2000 w. *Engng*—May 18, 1906. No. 77016 A.

The Tin Deposits of Alaska. Abstract of a report by Frank L. Hess, who visited and examined the prospects and development work in the York region of Alaska. 2800 w. *Ir Age*—May 31, 1906. No. 77030.

The Vulcan Tin Mine, North Queensland. Gives the history of a mine which has beaten the record of any lode tin mine in the world. 2200 w. *Min Jour*—May 19, 1906. No. 77010 A.

A Volumetric Method for Tin. James Darroch and C. A. Meiklejohn. Describes a volumetric method, for estimating tin, which gives good results, and is applicable to all ores of the metal, and an assay may be completed in an hour. 800 w. *Eng & Min Jour*—June 23, 1906. No. 77455.

Brookstead Tin Field. H. Grant. A review of the development of the Brookstead lode, in North-eastern Tasmania, showing the richness of the field, and the importance of thorough prospecting. 2000 w. *Aust Min Stand*—June 6, 1906. No. 77875 B.

Substitutes for Tin. L. Parry. The recent shortage of the tin supply makes it wise to consider the question of substitutes, and the principal uses to which the metal is applied are discussed and how far other metals could take the place of tin. 2000 w. *Min Jour*—June 2, 1906. No. 77268 A.

Tin Deep Leads in Selangor. H. Herbert Noyes. Information concerning the deep leads of Malay Peninsula, and the peculiarities of Chinese miners. 1500 w. *Min Jour*—May 26, 1906. No. 77133 A.

Geology of Malay Tin-Fields. Ralph Stokes. Describes the deposits and geological features so far as known. Ills. 1800 w. *Min Wld*—Sept. 8, 1906. No. 79044.

Industrial Position of the Malay Tin Fields. Ralph Stokes. An illustrated article discussing the prospects of the future yield of these fields. 2500 w. *Min Wld*—Sept. 1, 1906. No. 78946.

Occurrence of Tin in the St. Austell District. R. H. Williams. A review of this district in Cornwall, England, describing the geological structure. 1200 w. *Min Jour*—Sept. 8, 1906. No. 79230 A.

## MISCELLANY

## Vanadium

The Tin Deposits of North and South Carolina. Frank L. Hess. A review of the present development and promise of the region, with illustrations of the existing workings. 3500 w. *Engineering Magazine*—Oct., 1906. No. 79342 B.

Tin-Mining in the Malay States. John Place. Gives information relating to the country and an account of tin-ore mining. Ills. 2000 w. *Engng*—Aug. 31, 1906. No. 79136 A.

The Malay Tin-Fields. Ralph Stokes. Information concerning the Chinese mine workings and methods. Ills. 1800 w. *Min Wld*—Oct. 6, 1906. No. 79647.

The Tin-Deposits of the Kinta Valley, Federated Malay States. William R. Rumbold. Describes this district which is probably at the present time the richest alluvial tin-district in the world. Describes the deposits and discusses their origin. Ills. 3800 w. *Bul Am Inst of Min Engrs*—Sept., 1906. No. 79852.

## Tin-Plates.

The Manufacture of Tin-Plates. R. Beaumont Thomas. Briefly reviews the growth of the tin-plate industry and the uses to which tin-plates are put, and their successful manufacture, describing the various operations. Ills. 5500 w. *Inst of Mech Engrs*—July 30, 1906. No. 78559 D.

## Tungsten.

Tungsten Ore in Washington. M. H. Joseph. An account of the discovery. 700 w. *Eng & Min Jour*—March 3, 1906. No. 75332.

## Uranium.

Uranium: Its Preparation, Gravimetric Determination and Occurrence, Victor Blanc. From the *Trans. of W. Assn. of Tech. Chem. and Met.* Information concerning the discovery, appearance, determination, uses, etc. 2000 w. *Min Wld*—March 10, 1906. No. 75475.

Uranium. Victor Blanc, in *Western Chemist and Metallurgist*. Describes the metal and its properties, its occurrence, determination, etc. 2400 w. *Aust Min Stand*—March 28, 1906. No. 76554 B.

## Vanadium.

A New Occurrence of Vanadium in Peru. Foster Hewett. Preliminary notes concerning the deposit, containing vanadium, found near Cerro de Pasco. 1000 w. *Eng & Min Jour*—Sept. 1, 1906. No. 78932.

Utilizing Vanadiferous Sandstone. Dr. J. Ohly. Outlines a commercial process that might serve for the production of sodium uranate and ammonium vanadate. 2000 w. *Mines & Min*—Jan., 1906. No. 74244 C.

# Mining and Metallurgy

Zinc

MISCELLANY

Zinc

Zinc.

The Wisconsin Zinc Field. E. Hedburg. Gives the history of this region, describing the deposits and some of the mines, and the ore treatment. 3000 w. Min Wld—Jan. 20, 1906 No. 74489.

Zinc Industry, Broken Hill. Edward Laughton. Discusses the profits derivable and the different processes for recovering zinc from the tailings. 1800 w. Aust Min Stand—Dec. 6, 1905. No. 74445 B.

The Electrometallurgy of Zinc (Zur Elektrometallurgie des Zinks). Dr. Franz Peters. A general review of progress in the electrolytic separation of zinc during the past five years. Serial. Part I. 4000 w. Gluckauf—Dec. 2, 1905. No. 73842 D.

The Zinc Industry of the Rocky Mountain Region. W. G. Swart. Read before the Am. Min. Cong. An account of the processes used for removing the impurities and the methods of successfully handling these low-grade ores. 1800 w. Eng & Min Jour—Dec. 9, 1905. No. 73644.

Kelly, New Mexico. Robert B. Brinsmade. An illustrated account of a zinc camp whose ores have been made available by modern metallurgical methods. 5000 w. Mines & Min—Sept., 1906. No. 78913 C.

Mining and Milling at Platteville, Wis. Illustrates and describes the zinc-lead mines of this district, with the exception of the Enterprise mine, which has been previously described. 1200 w. Eng & Min Jour—Sept. 22, 1906. No. 79413.

The Mineral Point Zinc Works. Illustrated description of a plant where sulphuric acid and zinc oxide are made; and where mixed concentrates of blende and marcasite are treated by magnetic separation, producing high grade zinc concentrate. 2200 w. Eng & Min Jour—Sept. 1, 1906. No. 78935.

Zinc Mining in Chihuahua. Leonard Worchester, Jr. A brief account of the zinc mining industry, reporting the prospects good. 700 w. Min Wld—Sept. 15, 1906. No. 79212.

Milling in Southwest Wisconsin. George S. Brooks. Concerning the methods of concentration in the zinc fields of the Upper Mississippi, describing the deposits and giving plan of the concentrator plant. 2200 w. Eng & Min Jour—June 16, 1906. No. 77310.

Notes on a Mill Test. Benjamin Hodge. Reports a test made on a small zinc mill in the Wisconsin district, showing high efficiency. 1200 w. Min Mag—June, 1906. No. 77330 C.

The Zinc Industry in the United States. H. S. Clark. The conditions in the different districts, the methods of mining, treatment, etc., and the inventions used in the different fields are considered. 3800 w. Min Mag—June, 1906. No. 77327 C.

Zinc and Lead Deposits in Wisconsin. U. S. Grant. Information concerning the geology, ore deposits, mining and concentrating, and prospecting. Ills. 3000 w. Min Mag—June, 1906. No. 77326 C.

Zinc Ore in Northern New York. D. H. Newland. Describes deposits in St. Lawrence County, giving map and information of interest. 1000 w. Eng & Min Jour—June 9, 1906. No. 77198.

Zinc-Ore Mining in Wisconsin. A review of the development since 1902, when the application of magnetic separation removed the iron sulphide from the zinc blende. Details of shaft-sinking, pumping and mining are given, with map of the Enterprise mine. 3000 w. Eng & Min Jour—June 30, 1906. No. 77743.

The Concentration and Separation of Zinc-Lead Ores as Practiced in Summit County, Colorado. Illustrates and describes a plant at Breckenridge, Colo. 800 w. Min Rept—Nov. 16, 1905. No. 73267.

The Estimation of Zinc. H. Nissenson and W. Kettembeil. Abstract of a paper in *Chemiker Zeitung*. Gives a review of the volumetric methods and a report of experiments of the authors. 3000 w. Eng & Min Jour—Nov. 25, 1905. No. 73449.

The Wisconsin Zinc Fields. Begins an illustrated description of the important mines in this district, and the methods of working. 2000 w. Eng & Min Jour—Aug. 18, 1906. Serial. 1st part. No. 78634.

The Zinc Industry in Russian Poland. Historical review of the zinc industry in Poland, describing the mines, reporting the output, the conditions under which the production of calamine and the smelting of zinc are now carried on, etc. 3000 w. Min Jour—Aug. 11, 1906. No. 78673 A.

The Palmerton Works of the New Jersey Zinc Company. O. Pufahl. Translated from *Zeit. f. Berg-, Hutten- und Salinenwesen*. Brief description of the oxide works, spiegeleisen blast furnace, spelter works, lithopone works, and sulphuric acid works. 1200 w. Eng & Min Jour—Feb. 10, 1906. No. 74943.

Zinc Mining in 1905. A review of the progress made towards utilizing the zinc resources of British Columbia. Ills. 1700 w. B C Min Rec—Dec., 1905. No. 74789 B.

## RAILWAY ENGINEERING

### Zinc

### CONDUCTING TRANSPORTATION

### British Railways

The Wisconsin Zinc District. H. A. Wheeler. Describes an old lead and zinc producing district which modern machinery and methods have rendered profitable. Map. 6000 w. Mines & Min—March, 1906. No. 75458 C.

The Mining, Preparation and Smelting of Virginia Zinc-Ores. Thomas Leonard Watson. Treats of the purely economic phases of the zinc ores of this district. 4500 w. Ills. Bul Am Inst of Min Engrs—March, 1906. No. 76118.

Spelter Statistics for 1906. W. R. Ingalls. Statistics of this industry in the United States, showing where the ore was produced and where consumed. 3500 w. Eng & Min Jour—May 12, 1906. No. 76608.

The Lungwitz Process of Zinc Smelting. Fred W. Gordon. Describes a furnace recently put into operation at Warren, N. H., especially designed to meet the requirements of this process, and the problems in connection with its opera-

tion. 3000 w. Eng & Min Jour—April 28, 1906. Serial. 1st part. No. 76398.

Zinc Mining in New Mexico. R. W. Haddon. Describes the deposits of the Magdalena range, giving cross section, and reporting development. 1000 w. Eng & Min Jour—May 5, 1906. No. 76544.

Composite Metallurgical Vessels. A. L. Queneau. Illustrates and describes a new system of making zinc retorts and refractory crucibles. 2800 w. Eng & Min Jour—Oct. 13, 1906. No. 79775.

Industrial Analysis of Zinc. Messrs. Hollard & Bertiaux. An explanation of methods used. 2000 w. Min Jour—Oct. 6, 1906. No. 79801 A.

Zinc and Lead Mining in Wisconsin. Albert A. Hoskin. Describes the deposits and the features peculiar to this district, and gives the predictions of scientific investigators. 2000 w. Min Rept—Oct. 4, 1906. No. 79649.

See Electrical Engineering, Electro-Chemistry.

## RAILWAY ENGINEERING

### CONDUCTING TRANSPORTATION

#### Accidents.

How to Avoid Accidents. From a paper prepared by the Claim Department of the A., B. & C. Railroad calling attention to some of the causes of accidents and means of preventing them. 4000 w. R R Gaz—Vol. XL, No. 1. No. 74211.

Injuries to Passengers. Calls attention to the causes of many accidents, showing how they could be prevented. 4000 w. R R Gaz—Vol. XXXIX., No. 24. No. 73741.

The Catesby Tunnel Accident. An account of the accident occurring last Jan. on the Great Central Railway. 1500 w. Engng—March 16, 1906. No. 75807 A.

Accidents to Servants on American and British Railways. A comparison showing much better conditions in England than in America. 2400 w. Engr, Lond—March 30, 1906. No. 76017 A.

The Salisbury Railway Accident. An illustrated account of the accident to the boat-train express on the South-Western Railway, England. 2000 w. Engng—July 6, 1906. No. 77984 A.

Some Notes on the Recent Accident at Salisbury, England. Editorial discussion of this accident and its cause, and

some related matters concerning English railroads. 2000 w. Eng News—Aug. 9, 1906. No. 78536.

Accidents to Passengers on British Railways. Information from a recently issued Blue-Book, reporting the accidents during 1905. 1200 w. Engr, Lond—Sept. 28, 1906. No. 79710 A.

The Railway Accident at Grantham, England. An illustrated account of a serious disaster, Sept. 19, 1906, on the Great Northern Railway. 3500 w. Engng.—Sept. 28, 1906. No. 79706 A.

The Salisbury Accident. Gives Major Pringle's report to the Board of Trade on the accident of July 1, 1906. The minutes of the evidence and the appendices have been omitted. Also editorial. 9000 w. Engr, Lond—Oct. 5, 1906. No. 79807 A.

#### Baggage.

Baggage Service in the United States. E. Giese and Blum, in *Zeitung des Verkehrs*. An explanation of the system in use in America for forwarding baggage. 7700 w. Bul. Int Ry Cong—Jan., 1906. No. 75220 E.

#### British Railways.

British Railway Methods and Management with Special Reference to Safety

# RAILWAY ENGINEERING

## Car Movement

## CONDUCTING TRANSPORTATION

## Freight

in Operation. H. Raynar Wilson. A review of the various phases of promotion, construction, equipment and operation in British railway practice. Also editorial. 9500 w. Eng News—Aug. 30, 1906. No. 78896.

### Car Movements.

Beecham Car Transcribing System. Describes the system of car records used on the C., M., & St. P. Ry., and recently adopted by other roads. Its principal advantage is the ease with which information may be obtained concerning any car. 3500 w. R R Gaz—Vol. XL. No. 8. No. 74821.

### Car Supply.

Ways and Means to Maintain Car Supply. L. C. Bihler. Read before the Traffic Club of Pittsburgh. Discusses features that will assist in preventing shortages of cars. 4500 w. Pro St Louis Ry Club—July 13, 1906. No. 78352.

### Clearing House.

The Railway Clearing House. A brief account of this institution and its functions. 3500 w. Engr, Lond—July 6, 1906. No. 77987 A.

### Competition.

Competition Between Railway and River Transportation in the Early Part of the Railway Era: A Leaf from the History of the Hudson River R. R. Extract from an interesting paper by J. B. Jarvis, written in 1850, regarding the cost of transportation at that time. 4500 w. Eng News—March 22, 1906. No. 75651.

### Cost.

Cost per Mile Run. J. E. Goodman. Extract from address to the Northern Ry. Club, on the subject of locomotive repairs. 600 w. Ry & Loc Engng—July, 1906. No. 77864 C.

### Cuba.

Railroading in Cuba. Relates incidents in regard to travel on Cuban railways, both humorous and exasperating. 2500 w. Ry & Engng Rev—Dec. 16, 1905. No. 73786.

### Derailments.

Unexplained Derailments. G. H. List. Gives an account of some experiences gained during 13 years of service, which offer explanations for some accidents. 1500 w. Engr, Lond—Nov. 3, 1905. No. 73134 A.

### Difficult Feat.

A Difficult Railroad Transportation Feat. Illustrations, with brief account of the transportation of the very large castings of the "Lusitania." 400 w. Sci Am Sup—July 7, 1906. No. 77827.

### End Shocks.

End Shocks in Car Service and Provision for Same in Car Framing. A. Stucki. Indicates the conditions which cars should be required to meet and which could be used as a basis for handling the cars. 7200 w. Pro Ry Club of Pittsburgh—Sept., 1905. No. 73757 C.

### English Transportation.

What Can America Learn from Great Britain in Transportation? Archibald S. Hurd. Illustrates and describes the growth of the motor-train and motor-bus in England. 2500 w. Cassier's Mag—Oct., 1906. No. 79525 B.

### Explosives.

An Expert Report on the Transportation and Handling of Explosives by Railways. Full abstract of Dr. Charles B. Dudley's report, and of the report of the Committee of Experts. 8500 w. Eng News—Nov. 9, 1905. No. 73083.

Regulations for the Transportation of Explosives. Gives the regulations drafted by the committee of the Am. Ry. Assn. and approved at Chicago, Oct. 25, 1905. 3500 w. Eng News—Nov. 23, 1905. No. 73426.

### Fares.

Required Reduction of Passenger Fares in Ohio. Extracts from a document prepared by James McCrea to show why passenger fares should not be arbitrarily reduced to two cents a mile in the State of Ohio. 4500 w. R R Gaz. Vol XL. No. 7. No. 75023.

### Fast Express.

The Cote d'Azur Rapide. An illustrated account of the first-class passenger express which runs between Paris and the Mediterranean in half a day. 1000 w. Engr., Lond—Feb. 16, 1906. No. 75281 A.

### Fast Trains.

The Fastest Trains in Europe and America. Arnold Kramer, in *Annalen für Gewerbe und Bauwesen*. Information concerning the fastest regular trains at the present time. 900 w. Bul Int Ry Cong—Dec., 1905. No. 74562 E.

### Floods.

Flood Damages, N. W. R., India. G. H. List. An illustrated account of some of the railway disasters caused by floods, especially describing the destruction of the Pulkun-Nala bridge. 1800 w. Engr, Lond—April 6, 1906. No. 76083 A.

### Freight.

In Relation to the Transportation Problem. W. M. Prall. Principally a discussion of freight transportation and its problems. General discussion follows. 9000



# RAILWAY ENGINEERING

## Gould Railways

w. Pro Ry Club of Pittsburgh—Nov., 1905. No. 75097 C.

Some Ideas in Handling and Tracing High Class Freight. W. B. Harrison. Paper and discussion aiming to simplify the tracing of delayed freight. 3500 w. Pro Iowa Ry Club—Dec. 8, 1905. No. 74795 C.

## Gould Railways.

The Gould System. Gives a brief outline of the history prior to 1901, and treats in greater detail the events of the and discussing the outlook. 2200 w. last five years, showing the development, R R Gaz—April 20, 1906. No. 76149.

## Government Operation.

The First Railroad Owned and Operated by a Government. C. H. Caruthers. Gives an account of a railroad between Philadelphia and Lancaster, Pa., built in the early part of the 19th Century, and operated by the state. Ills. 4500 w. R R Gaz—Aug. 24, 1906. No. 78832.

## Italy.

The Government Railroad Monopoly in Italy. The first of a series of articles discussing this subject. 1200 w. R R Gaz—Vol. XL. No. 8. No. 75241.

## Long Island.

Long Island Railroad. Considers the last report for the year ending Dec. 31, 1905, and the causes of the great increase in expenses. 1600 w. R R Gaz—June 8, 1906. No. 77218.

## Motive Power.

The Motive Power Officer. G. M. Basford. An address delivered before the Mechanical Engineering Society of Purdue University. Explains the possibilities of the motive power problem, and some of the questions motive power men must decide. 4800 w. Ry Age—June 8, 1906. No. 77202.

## Performance.

Locomotive Performance Sheets. H. H. Vaughan. Describes the sheets in use on the Canadian Pacific, discussing the advantages of their arrangement. 2000 w. Am Engr & R R Jour—June, 1906. No. 77114 C.

## Railroads.

The Relations of the Railroads to the Public. R. C. Richards. Address before the Trans. Assn. of Milwaukee. Discusses things essential, the investigation of claims and complaints, improvements needed, etc. 2000 w. R R Gaz—May 11, 1906. No. 76612.

## Regulations.

Locomotives in Factories. Gives the draft regulations presented to the Home Secretary of the British Government, for use of locomotives and wagons on lines

## CONDUCTING TRANSPORTATION

## Transportation

and sidings in or used in connection with premises under the factory and workshop act. 2500 w. Col Guard—Sept. 28, 1906. No. 79703 A.

## South Africa.

The Cape Government Railways. Abstract of a paper by A. M. Tippet, read before the British Assn. at Cape Town, which gives information in regard to the working of these lines. Ills. 1800 w. R R Gaz—Vol. XXXIX., No. 20. No. 73224.

## Southern Roads.

The Southern Roads and the Territory They Serve. W. D. Taylor. Describes the conditions which have been the cause of slow railroad development in the South, and the present conditions, with information concerning the lines which control most of the southern traffic. 4200 w. Ry Age—Dec. 8, 1905. No. 73661.

## Standard Code.

Suggested Changes in the Standard Code. H. A. Dalby. Gives suggestions with explanations of why the changes are recommended. 5500 w. Ry Age—March 30, 1906. No. 75868.

## Tablet Exchange.

Whitaker's Electric Train Tablet Exchanger. Briefly outlines the mechanical and manual apparatus which has been in use, and gives an illustrated description of the new pattern invented by Mr. A. Whitaker. 1800 w. Engng—April 27, 1906. No. 76571 A.

## Train Control.

The Powell-Potter System of Automatic Control of Trains. Benton C. Rowell. From an address before the Nat. Assn. of Ry. Com., at Washington. An explanation of the system and its operation. 7000 w. Ry & Engng Rev—April 7, 1906. No. 75976.

The Raymond Phillips System of Train-Control. Brief illustrated description of this automatic train-control system. 1000 w. Engng—July 13, 1906. No. 78219 A.

## Train Dispatching.

See Street and Electric Railways.

## Train Service.

How to Improve Passenger Service. R. Marpole. A paper (condensed) presented at a Canadian Pacific officers' conference at Field, B. C. Briefly considers the track, the equipment and care of passenger trains, and the manning of the trains with capable men. 200 w. R R Gaz—Vol. XL., No. 10. No. 75444.

## Transportation.

The Canal and the Railroad from 1861 to 1865. From a paper by Emerson D.

# RAILWAY ENGINEERING

## Wastes

## MOTIVE POWER AND EQUIPMENT

## Boilers

Fite, in the *Yale Review*. A review of the remarkable growth and prosperity of these transportation industries. 5400 w. R R Gaz—Sept. 14, 1906. No. 79194.

## Wastes.

Economic Wastes in Transportation.

W. Z. Ripley. From a paper in the *Pol. Sci. Qr.* Discusses certain results sure to follow the wide acceptance of the blanket rates, and wastes in transportation service, and the remedy. 8000 w. R R Gaz—Sept. 28, 1906. No. 79498.

# MOTIVE POWER AND EQUIPMENT

## Acceleration.

Energy Expended on Car-Wheel Acceleration. A study explaining the method of calculation. 1000 w. Engng—March 9, 1906. No. 75599 A.

## Air-Brakes.

Air-Brakes in Freight Train Service. Abstract of the testimony recently presented at Washington by the representatives of various railway companies opposing the proposed increase in the number of air-brakes required on freight trains. 2200 w. Eng News—Nov. 9, 1905. No. 73086.

Percentages of Freight Cars Air Braked. Information in tabulated form showing how many cars are air-braked on the different roads, and how well the trains have been air-braked during the past six months. 1000 w. R R Gaz—Vol. XXXIX., No. 19. No. 73090.

New W. A. B. Equipment. The first of a series of illustrated articles which will describe the Westinghouse new air brake equipment for all classes of engines and cars now in use. 1700 w. Ry & Loc Engng—Feb., 1906. Serial. 1st part. No. 74857 C.

The New Westinghouse "K" Triple Valve. States the advantages and describes the action, giving information concerning its special features. Ill. 2500 w. R R Gaz—Vol. XL., No. 12. No. 75645.

Brakebeams and Foundation Rigging—The Requirements from the Standpoint of Safety and Emergency. Edward B. Leigh. Presents facts showing that foundation rigging and "emergency" service, should have immediate attention and treatment. 2800 w. Ry Age—May 25, 1906. No. 76984.

Brake Tests Made at West Seneca on the "Lake Shore and Michigan Southern Railway." Report of tests made on the Westinghouse brake known as the quick-service brake. 3000 w. Bul Int Ry Cong—April, 1906. No. 76954 E.

Comparative Test of Large Locomotive Air Pumps. Reports a comparative test of the new Westinghouse compound and the New York No. 5 duplex pumps, made

by the L. S. & M. S. Ry. 1800 w. Ry Age—May 18, 1906. No. 76717.

New S. F. Brake Valve. Illustrated description. 800 w. Ry & Loc Engng—June, 1906. No. 77108 C.

New Westinghouse K Triple Valve. Illustrated detailed description of the quick service triple valve and its operation. 1000 w. Ry & Loc Engng—June, 1906. No. 77109 C.

Type H. Automatic Brake Valve. Illustrated detailed description. 1700 w. Ry & Loc Engng—June, 1906. No. 77107 C.

Air Brake Piping. Shows how ells and short bends interfere with the action of the brakes, and how they can produce disastrous results. 1200 w. Ry & Loc Engng—Sept., 1906. No. 78957 C.

Diagrams of K. Triples. Gives five diagrammatic drawings illustrating the operative positions of the K triple valve, with explanatory notes. 1000 w. Ry & Loc Engng—Sept., 1906. No. 78956 C.

Handling the Air Brake in Passenger Train Service. C. C. Farmer. Presented to the Convention of the Trav. Engrs.' Assn. Discusses the means of securing a comparatively uniform distribution of the brake power throughout a train. 2200 w. R R Gaz—Sept. 7, 1906. No. 79099.

Possible Troubles and Their Remedies. Discusses some of the troubles that may happen to the E. T. equipment and their remedies. 1000 w. Ry & Loc Engng—Oct. 1906. No. 79606 C.

## Air Pump.

Eight and One-Half Inch Cross Compound Pump. Illustrated detailed description of the Westinghouse new 8½ in. cross-compound air-pump and its operation. 1500 w. Ry & Loc Engng—Aug., 1906. No. 78385 C.

## Boilers.

Riegel Water Tube Locomotive Boiler. Illustrates and describes a new design. 1200 w. Am Engr & R R Jour—April, 1906. No. 75851 C.

See Mechanical Engineering, Steam Engineering.

# RAILWAY ENGINEERING

## Brakes

### Brakes.

Savage Safety Brake. Describes this system and explains its object, reporting tests. 3500 w. Ry & Engng Rev—Jan. 20, 1906. No. 74486.

Advancement and Improvements in Air-Brakes. Walter V. Turner. Abstract of a paper read before the Cent. Elec. Ry. Assn. Aims to show that improvements in the system have kept pace with the development of locomotion. Explains some features introduced. 3500 w. St Ry Rev—April 15, 1906. No. 76063 C.

Kapteyn's Apparatus for Testing Continuous Brakes (Kapteyn's Prüfvorrichtung für Versuche mit Durchgehenden Bremsen). A. Führ. The successive action of the brake cylinders is recorded by pressure indicators on a moving band of paper. 2000 w. Glaser's Annalen—April 1, 1906. No. 76259 D.

Test of the Savage Air Brake. George L. Fowler. Illustrates and describes this arrangement and its action, reporting the tests made. 5500 w. R R Gaz—April 6, 1906. No. 75956.

Notes on Brakes. Edwin Freund. Explains the cause of skidding of locked wheels, the cause of locking, discusses brakes based on various principles, etc. 1800 w. Tram & Ry Wld—Aug. 9, 1906. No. 78672 B.

The Westinghouse Electromagnetic Brake. Rudolf Braun. Translated from *Elektrische Bahnen und Betriebe*. Illustrates several types, giving information in regard to their action and conclusions from trials. Ills. 5500 w. Bul Int Ry Cong—Aug., 1906. No. 79281 E.

### Brake Beams.

Brake Beams for 60,000, 80,000, and 100,000-lb. Freight Cars. Report of the Committee of the Master Car Builders' Assn. 3500 w. Eng News—June 14, 1906. No. 77437.

### Car Design.

Science Applied to Car Design. Illustrates and describes new features introduced in the Sullivan side-door car, used in suburban traffic on the Illinois Central Railroad. 1500 w. Ry & Loc Engng—March, 1906. No. 75489 C.

### Car Ferries.

Car Ferry Lines of American Railroads. Gives statistics of lines operated by 35 companies, and illustrations, with description of methods and other information. 3300 w. R R Gaz—June 8, 1906. No. 77227.

### Car Heating.

Mixed System of Heating Railway Trains by Steam and Water (Chauffage

## MOTIVE POWER AND EQUIPMENT

## Cars

des Trains par la Vapeur et l'Eau Combinées). H. Guérin. A description of the Baudry system, used on the Paris-Lyons-Mediterranean line. Radiators containing water are heated by a circulation of steam. 2500 w. 1 plate. Génie Civil—May 12, 1906. No. 77614 D.

### Car Hygiene.

Hygiene as Applied to Railway Coaches. Dr. J. M. Gassaway. Discusses the danger of infection, reporting tests made, and concluding that as long as coaches are cleansed and aired, the danger is of slight consequence. 4800 w. Pro St Louis Ry Club—Feb. 9, 1906. No. 75309.

### Car Lighting.

McElroy Automatic Car-Lighting System. This electric car-lighting system is illustrated and described in detail. 1500 w. R R Gaz—June 8, 1906. No. 77226.

The "Vickers-Hall" System of Electric Lighting for Railway Carriages. Illustrated detailed description of this system and its action, stating the advantages claimed. 2500 w. Elec Rev, Lond—June 1, 1906. No. 77266 A.

See Electrical Engineering, Lighting.

### Card Index.

The Application of Card Index Systems to a Motive Power Office. J. H. Winne. Explains the advantages of the card system for railway office records. Also discussion. 6400 w. Pro Ry Club—Jan. 16, 1906. No. 75224 C.

### Cars.

A Combination Stock and Drop-Bottom Dump Car. Illustrates and describes a new type of 80,000-lb. stock car, intended primarily for coal or coke service when not carrying stock. 600 w. R R Gaz—Vol. XXXIX., No. 18. No. 72977.

50-Ton Steel Twin Hopper Gondola Car. Illustrates and describes cars almost entirely of structural steel, and having several departures from ordinary designs. 1,000 have been received by the L. S. & M. S. Ry. 1500 w. Am Engr & R R Jour—Nov., 1905. No. 72944 C.

Large Freight Cars (Güterwagen von Hoher Tragkraft). E. Metzeltin. With numerous illustrations of flat top, box, and hopper cars of the largest sizes in German, British, and American railway service. Serial. Part I. 3000 w. Zeitschr d Ver Deutscher Ing—Nov. 4, 1905. No. 73307 D.

New Types of Railway Rolling Stock (Quelques Nouveaux Types de Matériel de Chemins de Fer). H. Chevalier. Describing some new coaches and sleeping cars of the Western Railway of France.

# RAILWAY ENGINEERING

Cars

## MOTIVE POWER AND EQUIPMENT

Cars

2500 w. 1 plate. Mem Soc Ing Civ de France—Sept., 1905. No. 73337 G.

Steel Cars for the New York Central's Electric Suburban Service. Illustrated description of all-steel cars. 1500 w. R R Gaz—Vol. XXXIX., No. 18. No. 72978.

Baggage Car for Automobiles. Brief illustrated article showing the construction. 400 w. Am Engr & R R Jour—Dec., 1905. No. 73530 C.

Construction of a Passenger Car. C. F. Rydberg. Read before the Canadian Ry. Club. A general discussion of the more important points in the construction. 5000 w. Ry & Engng Rev—Dec. 2, 1905. No. 73502.

Car Construction and Cost Records: Chicago, Milwaukee & St. Paul Railway. Describes the system of records adopted by this road and special features of the construction and repair work. 2800 w. Eng News—Jan. 25, 1906. No. 74565.

Design of Steel Cars with Reference to Repairs. A Stucki. A discussion of points that should be carefully watched in order to facilitate the repair of steel cars. 1500 w. Am Engr & R R Jour—Jan., 1906. No. 74102 C.

Steel Railway Coaches. Brief illustrated description of steel coaches for the Great Northern and City Railway. 900 w. Engr, Lond—Dec. 22, 1905. No. 74159 A.

High-Capacity Wagons for Belgium Railways. Illustrates and describes a 35-ton hopper ore-wagon, and a 40-ton wagon for transport of rails, shown at the Liège exhibition. 500 w. Engng—Jan. 26, 1906. No. 74894 A.

New Bogie Transport Cars. Brief illustrated description of cars recently constructed for the transport of steam plowing engines, or similar machines. 300 w. Sci Am Sup—Feb. 17, 1906. No. 75027.

Second-class Carriage for the International Express Service. Illustrated description of a car designed to seat a larger number of passengers than usual, without increasing the weight of the vehicle. 300 w. Engng—Feb. 9, 1906. No. 75072 A.

The American Palace Car "Columbia." Illustrates and describes the operating mechanism of a combination parlor car and sleeping car. The berths are stored beneath the floor. 800 w. Ry Mas Mech—Feb., 1906. No. 74827.

Thirty-five Ton Steel Gondola Cars for the Natal Government Railways. Brief illustrated description of high-sided gondolas for coal traffic. 300 w. Ry Age—Feb. 2, 1906. No. 74835.

All-Steel Drop Bottom General Service Gondola Car for the Frisco System. Illustrated description of cars showing

new points in design. 800 w. R R Gaz Vol. XL., No. 12. No. 75644.

Box Car for Automobiles. Illustrated description of a type of car being built at the Pennsylvania's shops for the transportation of automobiles. 600 w. Ry & Loc Engng—March, 1906. No. 75488 C.

The Six-Axle Cars of the International Sleeping-Car Company (Voitures à Six Essieux de la Compagnie Internationale des Wagons-Lits). Illustrating the new dining cars and compartment sleeping cars of the International Company, fitted with six-wheel bogie trucks at each end. Special details of the trucks are shown. 1800 w. 1 plate. Génie Civil—March 31, 1906. No. 76216 D.

Car Department Control. F. Lincoln Hutchins. Discusses the fundamentals of car department management, how to make the records, and how to make them show the actual performance. 3500 w. Ry Age—April 20, 1906. No. 76168.

The Betts Car Reporting System. Describes this new system used in making up accurate car records, recently installed in the Chicago North-Western Ry. Gives blanks used. 1200 w. R R Gaz—April 27, 1906. No. 76379.

Third-Class Carriage for the Belgian State Railways. Illustrated description. 600 w. Engng—April 6, 1906. No. 76079 A.

Rapid Railway-Carriage Building. An illustrated account of work carried out in India at the Parel workshops of the Great Indian Peninsula Railway Company. 800 w. Engng—May 18, 1906. No. 77017 A.

Steel Flat-Cars for Specially Heavy Loads. Illustrates and describes recently built cars, designed to carry heavy castings and peculiar designs. The 100-ton car for the Allis-Chalmers Co.; 87-ton and 60-ton cars: Pennsylvania R. R.; and 60-ton car: General Electric Co. are considered. 2200 w. Eng News—May 24, 1906. No. 76779.

Steel Rolling Stock. George Harrison Sheffield. Abstract of a paper read before the Tram. & Lgt. Rys. Assn. Does not consider a combination of steel and timber desirable, reports condition of all-steel cars in long service, and discusses changes and improvements in rolling stock. 3300 w. Elect'n, Lond—April 27, No. 76567 A.

Very Heavy Capacity Flat Car. Illustrated description of a novel freight car design, built at the C. M. & St. P. Ry. shops in West Milwaukee for the Allis-Chalmers Co. It is designed for a load capacity of 100 tons, with a permissible

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10 per cent overload. 1200 w. Ry & Engng Rev—April 28, 1906. No. 76403.

Box Car with Hatches for Loading and Unloading Through the Roof: Tehuantepec National Railway, Mexico. Sectional plan, sectional side elevation with brief description and dimensions. 400 w. Eng News—June 21, 1906. No. 77412.

Freight-Car Construction and Its Commercial Aspect. L. H. Turner. A discussion of some of the weak points in car construction. 1500 w. Am Engr & R R Jour—June, 1906. No. 77116 C.

New Types of Goodwin Car. Illustrated description of a new design of flat bottom gondola dumping cars, having unusually large discharge openings. 1000 w. Ry & Engng Rev—June 9, 1906. No. 77213.

One Hundred Ton Capacity Flat. Illustrations, sections, and description of the car built for the Allis-Chalmers Co. 1000 w. Ry & Loc Engng—June, 1906. No. 77104 C.

Phosphate Cars for the Atlantic Coast Line. Illustrated description of a combination of a box car and a center dump hopper car, having a capacity of 80,000 lbs. 600 w. R R Gaz—June 8, 1906. No. 77222.

Standard All-Steel 60-Ft. Postal Car for the Harriman Lines. Drawings and description. 600 w. R R Gaz—June 22, 1906. No. 77447.

Standard 80,000-lb. Box Car for the Rock Island-Frisco System. Drawings and description of the standard design for a box car. 900 w. R R Gaz—June 8, 1906. No. 77219.

The 50-Ton Box Car as a Standard in Railroad Equipment. W. E. Symons. Discussing whether the results obtained from the use of the 50-ton car in actual service will justify its extended use in all localities as a standard car, in place of the 40 or 30-ton car. 3000 w. R R Gaz—June 8, 1906. No. 77220.

New Third-Class Cars for the Midi Railway of France (Les Nouvelles Voitures de Troisième Classe de la Compagnie des Chemins de Fer du Midi). Francis Marre. Illustrating a new corridor carriage, for 66 third-class passengers. The design includes improved heating, lighting, and toilet arrangements. 1000 w. 1 plate. Génie Civil—May 19, 1906. No. 78116 D.

Automobile and Horse Car. Illustrated description of a car for the transportation of automobiles, horses and carriages, for the express service of the Bos-

ton & Maine Railroad. 1200 w. Ry & Loc Engng—Sept., 1906. No. 78958 C.

Bogie Composite Lavatory Carriage for the South-Eastern and Chatham Railway. Illustrated description. Plate. 700 w. Engng—Aug. 31, 1906. No. 79139 A.

Steel Car Equipment on the Long Island R. R. W. N. Smith. Illustrated detailed description of the Standard type of rolling equipment for the electric lines. 3500 w. Ry & Engng Rev—Sept. 1, 1906. No. 78960.

All Steel Cars for Passenger Transportation. Illustrates and describes types of passenger cars to be built at the new plant of the Pressed Steel Car Co., Pittsburgh, Pa. 1200 w. Ry & Engng Rev—Oct. 27, 1906. No. 80116.

High-Capacity Freight Wagons for the Indian Railways. Illustrates and describes a 20-ton wagon for the Madras Railway; and a covered wagon for the Barsi Light Railway. 1000 w. Col Guard—Sept. 28, 1906. No. 79701 A.

Permanent Stakes for Gondola and Flat Cars. Statistics concerning the expense and waste in the present method of requiring lumber shippers to furnish the stakes necessary, and illustrated description of the Harvey permanent-steel stake as applied to various types of cars. 1300 w. Ry Age—Oct. 10 1906. No. 80022.

Steel Underframe Postal Car. Illustrated detailed description of a car for the Santa Fé system. 700 w. Am Engr & R R Jour—Oct., 1906. No. 79603 C.

The Herr Dump Car. Construction drawings and description of a car of this type especially adapted to carrying ore. 800 w. Ry Age—Oct. 12, 1906. No. 79762.

## Controversy.

Controversy Over Continuous Current and Single-Phase Systems. A review of the discussion caused by the proposed installation of the single-phase alternating current system in the electrification of the N. Y., N. H. & H. R. R. entering New York City. 4800 w. Ry & Engng Rev—Jan. 13, 1906. No. 74376.

## Crank Axles.

The Advantages of Crank Axles for Locomotives. W. F. Cleveland. An explanation of the conditions and the satisfactory change effected by the use of crank axles. 1000 w. Sci Am—Sept. 22, 1906. No. 79290.

## Cylinders.

Locomotive Cylinders. Hal. R. Stafford. Considers some of the problems in modern practice, and gives suggestions for solving them. Ills. 3000 w. Am

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## Draft Gears

Engr & R R Jour—Jan., 1906. No. 74100 C.

## Draft Gears.

Friction Draft Gear. R. H. Blackall. Reviews the development, discussing the uses, advantages, cost, &c., comparing the results of twin and friction gears in service. 3000 w. 1 table and fig. Bul Int Ry Cong—Oct., 1905. No. 73403 F.

Functions of a Good Draft Gear. A. Stucki. Considers the functions in detail, and urges simplicity of construction. 2500 w. R R Gaz—Vol. XL. No. 8. No. 75237.

American Engineer Tests on Locomotive Draft Appliances. Committee report of the results of tests carried out, and the methods. 3000 w. Am Engr & R R Jour—June, 1906. No. 77119 C.

Friction Draft Gear on Cars and Locomotives. W. O. Thompson. Gives examples showing the importance of high cushion resistance, considers the measures of efficiency, and the different kinds of draft gear tests, etc. General discussion. Ills. 18000 w. Pro Cent Ry Club—May 11, 1906. No. 77293 C.

## Derailment

Overturning of Locomotives. Rollo Appleyard. Discussion of the super-elevation of curves and its influence on derailment; explaining the Salisbury accident. 800 w. Mech Engr—Sept. 1, 1906. No. 79122 A.

## Dynamometer Car.

Note on the Dynamometer Car of the Belgian State Railway. A. Huberti and J. Doyen. Illustrated description of the car and appliances and the working. 9600 w. Bul Int Ry Cong—Dec., 1905. No. 74561 E.

## Electricity.

Report of Committee of American Railway Master Mechanics' Association on Electricity on Steam Railroads. 3000 w. Ry & Loc Engng—June, 1906. No. 77446 C.

## Electric Locomotive.

Operation of Electric Locomotive During a Snowstorm. An illustrated account of a very interesting test made of one of the N. Y. C. electric locomotives, near Schenectady, N. Y., during a severe snowstorm. 1200 w. R R Gaz—Vol. XL. No. 7. No. 75022.

Electric Locomotives for the Simplon Tunnel (Locomotives Electriques pour le Tunnel du Simplon). S. Herzog. A general description of the Brown, Boveri three-phase locomotives designed for the Simplon-tunnel service. 2000 w. 1 plate. Génie Civil—March 10, 1906. No. 75717 D.

## MOTIVE POWER AND EQUIPMENT

## Electrification

Tests on Electric Railway Traction (Essais de Traction Electrique). P. Dumas. A report of tests with electric locomotives on the narrow gauge railroad of Saint-Georges-de-Commiers at La Mure, in the south of France. The electric current is derived from the works at Grenoble. 30,000 w. Ann des Ponts et Chaussées—4 Trimestre, 1905. No. 75778 E+F.

The Single Phase Electric Locomotive for Heavy Passenger and Freight Service. C. Renshaw. On the Development of the single-phase alternating current motor and its practical application for the electrical operation of trunk line service. Interesting discussion. Ills. 7000 w. Pro Ry Club of Pittsburgh—Dec. 22, 1905. No. 75626 C.

Electric Locomotive Tests on the Seebach-Wettingen Railway. Frank C. Perkins. Brief account of the tests, with illustrations. 1100 w. Ry & Engng Rev—July 14, 1906. No. 77958.

Electric Locomotives for the Spokane & Inland Ry. Illustrated description of an electric locomotive designed for general freight service, with information concerning the lines on which it will operate. 1000 w. Ry & Engng Rev—Aug. 11, 1906. No. 78509.

## Electric Traction.

See Street and Electric Railways.

## Electrification.

A Note on the Electrification of Trunk Line Railways. H. Ward Leonard. Points out the advantage of electricity for freight haulage, because of the possibility of making up larger train units at a lower cost per ton mile. 1600 w. St Ry Jour—Jan. 27, 1906. No. 74725 C.

Electrification of the New York Central Terminal in and near New York City. An illustrated detailed description of the important changes, considering the organization, line, power, track, terminals and stations. Six insets. 8400 w. Ry Age—Jan. 26, 1906. No. 74721.

Electrification of the Paris-Orleans Suburban Line. Illustrates and describes the electrification of the Paris-Juvisy section. The traction is effected by electric locomotives or rail motorcars, which take continuous current at 600 volts from an outside third rail. 1600 w. Engng—Jan. 5, 1906. No. 74417 A.

The Electrical Equipment for the New York Central. Interesting letters on this subject from Mr. George Westinghouse and B. G. Lamme. 600 w. Elec Wld & Engr—Dec. 30, 1905. No. 74163.

Electric Traction on the Lancashire and Yorkshire Railway. An illustrated ac-

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count of new lines to be electrified, or already in service. Maps. 3000 w. Elec Engr, Lond—July 6, 1906. No. 77960 A.

Hammersmith and City Railway Electrification. Principally an illustrated description of the Park Royal power-station of the Great Western Railway. 6800 w. Tram & Ry Wld—July 12, 1906. No. 78212 B.

The Electrical Equipment of the Great Western Railway. An illustrated detailed description of the plan of generating stations and distribution. 6000 w. Elect'n, Lond—June 22, 29, 1906. Serial—2 parts. No. 77887 each A.

Electrical Equipment of the West Shore. An account of the important work in progress between Utica and Syracuse, N. Y. Ills. 1500 w. Ry Age—Sept. 7, 1906. No. 79075.

Electric Traction on the Blankenese-Ohlsdorf Railway (Der Elektrische Betrieb der Bahn Blankenese-Ohlsdorf). G. Schimpff. A very complete account of the conversion from steam to electricity, of a local road near Hamburg. Two articles. 3 plates. 6000 w. Glaser's Annalen—Sept. 1, 15, 1906. No. 79334, each D.

The Present Status of the Electrification of the New York Zone of the New York Central & Hudson River R. R. W. J. Wilgus. An illustrated article showing the progress made in these extensive improvements, and commenting on the problems that have had to be solved. 2000 w. Elec Rev, N Y—Sept. 8, 1906. No. 79048.

The Rotary Converter Substations and Electric Car Equipment of the Long Island Railroad. An illustrated article describing the substation buildings and their equipment, the train service, cars, etc. 6000 w. Eng News—Sept. 27, 1906. No. 79470.

Ward Leonard-Oerlikon Locomotives. Illustrates details of the Oerlikon system. Describes a locomotive carrying a converter for transforming the single-phase currents into direct currents. 1500 w. Elec Engr, Lond—Sept. 7, 1906. No. 79216 A.

The Single-Phase System in Steam Line Electrification and Electric Railway Development. Calvert Townley. Discusses the single-phase alternating current system and its value in the electrification of steam lines. 2500 w. Elec Rev, N Y—Sept. 8, 1906. No. 79049.

Locomotives vs. Motor Cars. Clement F. Street. From a paper read before the New England R. R. Club. Discusses when electric locomotives are better than motor cars, the advantages of each for

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certain service, etc. 2200 w. Elec Jour—Oct., 1906. No. 79896.

Steam Locomotive and Electric Operation for Trunk-Line Traffic—A Comparison of Costs and Earnings. Joseph Mayer. Gives arguments tending to show that the electric operation of many steam railroads will be very profitable. Also an appendix on the mechanical theory of the contact conductor for high-speed trains. 15000 w. Pro Am Soc of Civ Engrs—Sept., 1906. No. 79533 E.

Sub-Stations and Transmission System of the New York Central & Hudson River Railroad. Illustrated detailed description. 2200 w. Elec Wld—Oct. 27, 1906. No. 80114.

The New York Central's Terminal Electrification at New York. A full illustrated description of present progress in the work of electrification on this road. 2800 w. R R Gaz—Oct. 5, 1906. No. 79641.

What Are the Possibilities in Operating the Mountain Divisions of Western Railways with Electric Power? A letter from E. N. Percy, describing opportunities for using electricity generated by water-power, with editorial discussion. 3000 w. Eng News—Oct. 4, 1906. No. 79624.

## Explosion.

Explosion of a Locomotive Boiler near the Saint-Lazare Station, Paris. Robert Dubois. Gives general information, description of the engine, and methods of investigation, with many illustrations. 6800 w. Bul Int Ry Cong—March, 1906. No. 76361 E.

## Fire-Boxes.

Early Experiments with Smoke-Consuming Fire-Boxes on American Locomotives. C. H. Caruthers. An interesting illustrated review of types of boilers, fire-boxes, &c., brought out between 1857 and 1859 aiming to consume the smoke and gases of bituminous coal. 2500 w. R R Gaz—Vol. XXXIX., No. 22. No. 73545.

Recent Investigations of Copper Fire Boxes (Neue Versuche mit Kupfernen Feuerbüchen). G. Dinglinger. A study of the behaviour of copper in the fire boxes of locomotive boilers as regards expansion, safety and efficiency. 2000 w. Glaser's Annalen—March 15, 1906. No. 75751 D.

Repairs to Wide and Narrow Fire-boxes. Information from an address by James F. De Voy regarding repairs to wide and narrow fireboxes, showing that in repairs the narrow firebox is the more economical, especially in high-speed locomotives. 1300 w. R R Gaz—Sept. 21, 1906. No. 79400.

## Fire-Boxes

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## Front Ends

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### Front Ends.

Locomotive Front Ends. The report submitted by the committee appointed by the Master Mechanics Assn. 3000 w. Ry & Loc Engng—July, 1906. No. 77865 C.

### Headlights.

Oil vs. Electric Headlights. S. A. Abbott. Read before the Int. Gen. Foremen's Assn. Sets forth the advantages claimed for the electric headlight. 1700 w. Ry & Loc Engng—June, 1906. No. 77106 C.

### Hospital Car.

Hospital Car for the Southern Pacific. Illustrated description of a handsome special car, which is arranged for hospital service, but so constructed that it can be used as a private car. 1000 w. Ry Age—Nov. 3, 1905. No. 73047.

A Hospital Car for the Southern Pacific Ry. Illustrates and describes an unusually large and well-equipped hospital car. Also refers to this class of cars in use on other roads. 2000 w. Eng News Jan. 11, 1906. No. 74332.

### Indicators.

Locomotive Tachographs. Illustrates and describes types of speed indicators for automatically registering the speed of trains, discussing their advantages. 1800 w. Engr, Lond—July 13, 1906. No. 78221 A.

### Injectors.

Locomotive Injectors, Modern Practice. Strickland L. Kneass. Abstract of a paper read before the Traveling Engrs. Assn. Explains the principle upon which the injector operates, the importance of the location, the systems in use and the desirable features of the ideal modern locomotive injector. 2000 w. Ry Age—Dec. 29, 1905. No. 74099.

### Inspection Cars.

Motor-Driven Inspection Cars for Railway Service. Illustrates one of the Sheffield Car Co.'s gasoline motor cars, and Olds single-cylinder railway motor car, with descriptive notes and general discussion. 1200 w. Eng News—March 8, 1906. No. 75439.

### Liquid Fuel.

Locomotive Firing with Liquid Fuel. A. S. Atkinson. Describes the arrangements for the general use of oil as a fuel in Southern California, and discusses the important factors favoring the use of oil for locomotive firing. 2500 w. Boiler Maker—April, 1906. No. 75991.

Petroleum. Fuel in Locomotives in the Tehuantepec National Railroad of Mexico. Louis Greaven. Gives the results obtained by the use of liquid fuel for

one year. Ills. 4000 w. Inst of Mech Engrs—March 16, 1906. No. 76666 N.

### Locomotive Boiler.

Brotan Locomotive Boiler with Water Tube Firebox. Illustrated detailed description of a boiler being introduced on several foreign roads. It was designed to obviate the difficulty found with copper fireboxes and staybolts, especially when used for high pressures. 1600 w. Ry Age—May 4, 1906. No. 76535.

The Robert Water-Tube Locomotive Boiler. Illustrated description of a boiler exhibited at Milan. 1000 w. Engng—Aug. 24, 1906. No. 79011 A.

The Care of Locomotive Boilers at Terminals and While in Service. Gives the reply of J. F. Roddy (condensed) to a list of questions sent out. Also summary of other replies. 2000 w. Eng News—Oct. 4, 1906. No. 79622.

### Locomotive Failures.

A Ten Years' Record of Locomotive Failure. Gives some results of a careful study made of locomotive casualties on an English road, covering ten years. 1500 w. Am Engr & R R Jour—April, 1906. No. 75854 C.

### Locomotive Frames.

Welding Locomotive Frames. Extracts from a paper by R. P. C. Sanderson, before the M. M. Assn. Report of the writer's experiences in learning to use Thermit successfully. 2200 w. R R Gaz—July 13, 1906. No. 77950.

The Frame of a Locomotive Considered as a Rigid Beam on Spring Supports (Der Lokomotivrahmen als Starrer Balken auf Federnden Stützen). O. Denecke. A mathematical investigation of the distribution of stresses in the main frames of locomotive engines, with graphical diagrams for practical use. 3500 w. Glasers Annalen—Oct. 15, 1906. No. 79970 D.

The Repairing of Locomotive Frames. From a paper read by S. Uren before the National Railroad Blacksmiths' Association. Illustrates and describes methods of welding. 1300 w. Am Engr & R R Jour—March, 1906. No. 75315 C.

### Locomotives.

A Lehigh & New England Rebuild. Illustrates the engine before and after rebuilding, describing the changes. 500 w. Ry & Loc Engng—Nov., 1905. No. 72934 C.

Austrian 0-10-0 Locomotive. Karl Göldsdorf. Illustrated description of a design built in 1901 for the State Railways. Also some of the most recent designs. 400 w. Ry & Loc Engng—Nov., 1905. No. 72932 C.



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Bogie Tank Locomotive, Madrid and Alicante Railways. Illustrates and describes double-bogie tank engines for heavy suburban service. 400 w. Engr, Lond—Nov. 17, 1905. No. 73463 A.

British Locomotives in 1904. Charles Rous-Marten. Discusses the designs and the good locomotive work. 6200 w. Ills. Bul Int Ry Cong—Oct., 1905. No. 73402 F.

Compound Freight Locomotive (Locomotive Compound à Marchandises). F. Barbier. Describing a double motor-bogie engine of 102 tons weight designed for the heavy coal traffic of the Northern Railway of France. 2000 w. 1 plate. Génie Civil—Oct. 28, 1905. No. 73313 D.

Compound Locomotives on the Great Western Railway. A. G. Robins. An interesting account of the work of the express locomotives of the Great Western Railway, and the results of test made with engines of the de Glehn type. Ills. 4500 w. Engng—Nov. 3, 1905. No. 73130 A.

Compound Locomotives with Superheaters. Illustrated description of a compound consolidation freight locomotive with superheater, for the Minneapolis, St. Paul & Sault Ste. Marie Ry. 1200 w. Eng News—Nov. 23, 1905. No. 73420.

Consolidation Locomotive for the Imperial Government of Japan. Illustrates the 2-8-6 type of locomotive, a number of which have been built in America for Japan. 500 w. Ry & Loc Engng—Nov., 1905. No. 72931 C.

Engine Equipments. R. Emerson. Gives a representative list of the appurtenances and appliances, discussing how to improve conditions, the cost of installing a new system, the method, &c. 3500 w. Am Engr & R R Jour—Nov., 1905. No. 72946 C.

Four-Cylinder Compound Freight Locomotive for the Swiss Railways (Vierzylinder Verbund Güterzug Lokomotive der Schweizerischen Bundesbahnen). M. Weiss. Illustrated description of a 66 ton counterbalanced compound engine for heavy freight service in Switzerland. 1800 w. 1 plate. Schweiz Bauzeitung—Oct. 21, 1905. No. 73332 B.

4-Cylinder Compound Locomotives in Belgium. Charles S. Lake. Reviews the tendencies of modern locomotive practice in Belgium, and gives illustrated descriptions of two heavy engines of great power recently built. 1500 w. Mech Engr—Oct. 28, 1905. No. 72995 A.

Four-Cylinder Express Locomotive for the London and South-Western Railway. Illustrated detailed description of a new and interesting engine designed by Mr.

Drummond. 1000 w. Engng—Nov. 10, 1905. No. 73291 A.

4-6-0 Engine for the D. L. & W. Illustration and description of recently completed passenger engines designed to burn fine anthracite coal. 600 w. Ry & Loc Engng—Nov., 1905. No. 72928 C.

Heavy Duplex Compound Goods Locomotive. Photograph and sectional elevation, with description of one of two heavy articulated compound locomotives designed by Mons. de Bosquet, of the Northern Ry. of France. 900 w. Prac Engr—Oct. 27, 1905. No. 72992 A.

Heavy Ten-Wheel Passenger Locomotive for the Delaware, Lackawanna & Western R. R. Illustration, dimensions and brief description of a heavy (4-6-0) passenger engine. 500 w. R R Gaz—Vol. XXXIX., No. 20. No. 73230.

Performance of a Balanced Compound Locomotive, A. T. & S. F. Ry. Illustration, with report of very satisfactory work. 800 w. Ry & Engng Rev—Nov. 4, 1905. No. 73049.

Peter Cooper's Locomotive. A brief account of one of the earliest locomotives in America, running from Baltimore to Ellicott's Mills in 1830. 400 w. Ry & Loc Engng—Nov., 1905. No. 72927 C.

Six-Coupled Express Engines on the London & North-Western Railway. Charles Rous-Marten. Describes the latest locomotive designed for the express service of this road, explaining the difficult conditions between Crewe and Carlisle. 4500 w. Engr, Lond—Nov. 10, 1905. No. 73292 A.

The Steam Locomotive. J. K. Brassill. An illustrated review of its evolution and development as evidenced by the exhibits in the transportation building at the St. Louis World's Fair. 18500 w. Pro Pacific C Ry Club—Oct. 21, 1905. No. 72926 C.

Two Baldwin Four-Cylinder Balanced Compound Locomotives. Illustrated descriptions of two new types. An Atlantic (4-4-2) type engine, and a Pacific (4-6-2) engine. 500 w. R R Gaz—Vol. XXXIX., No. 19. No. 73088.

Vauclain 4-Cylinder Balanced Compound Atlantic Type Locomotive. Illustrated description of locomotives recently built for the C. R. I., & P. Ry. 400 w. Am Engr & R R Jour—Nov., 1905. No. 72947 C.

Baltimore and Ohio Consolidation Locomotive. Illustrated descriptions of locomotives from special designs, 210 of which are being built. An account of the

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requirements to be met is also given. 1700 w. Ry Age—Dec. 22, 1905. No. 73991.

Comparative Magnitude of Longitudinal Disturbing Forces in a Cole Balanced Compound and a Single Expansion Express Locomotive. Edward L. Coster. Gives an analysis of the relative horizontal inertia effects. 800 w. Am Engr & R R Jour—Dec., 1905. No. 73531 C.

Consolidation Locomotive for the Baltimore & Ohio Railroad. Gives particulars of interest regarding these engines. 1500 w. R R Gaz—Vol. XXXIX., No. 24. No. 73740.

Electric vs. Steam Locomotives. R. H. Probert. Read before the Ohio Soc. of Elec., Mech., and Steam Engrs. Considers a general example showing the lower cost of operation and other advantages from electrical equipment. 4500 w. Engr, U S A—Dec. 1, 1905. No. 73621 C.

Four-Coupled Express Locomotive for the Belgian State Railways. H. W. Hanbury. Illustration with description of an engine for express passenger service, of simple type with inside cylinders and Stephenson motion. 800 w. Engng—Dec. 1, 1905. No. 73689 A.

Four-Cylinder Compound Locomotive for the Paris, Lyons, and Mediterranean Railway. H. W. Hanbury. Illustrated detailed description of a six-coupled locomotive believed capable of maintaining an average speed of 50 miles per hour on varying gradients, with a load of 300 tons. 1500 w. Engng—Nov. 24, 1905. No. 73604 A.

German Compound Locomotive with Superheater. Illustrates an interesting type of high-speed locomotive, giving brief description. 300 w. Ry Age—Dec. 1, 1905. No. 73507.

Goods Locomotives on British Railways. Charles S. Lake. The practice of recent years in England is illustrated and described. 1600 w. Mech Engr—Dec. 9, 1905. Serial. 1st part. No. 73900 A.

Lackawanna Eight-Wheel Passenger Locomotives with Superheater. The engine 955 equipped with Cole superheater, with piston valves, is illustrated and described. 500 w. Ry Age—Dec. 15, 1905. No. 73780.

Locomotives of the Belgian State Railway at the Liège Exhibition. F. Matthei. Illustrations, descriptions of types, and general remarks. 9400 w. Table. Bul Int Ry Cong—Nov., 1905. No. 73752 E.

Newest Caledonian Engines and Their Work. Charles Rous-Marten. Describes in detail the latest engines of the Caledonian Railway, and some of the work

done by them. 4300 w. Engr, Lond—Dec. 8, 1905. No. 73909 A.

Pacific Balanced Compound for the Santa Fé. Illustrated description of a large passenger engine with four compound cylinders and Vauclain's engine arrangement. 300 w. Ry Age—Dec. 8, 1905. No. 73660.

Panama Canal Engines. Illustrated description of a 2-6-4 type of engine to be used in the construction of the canal. 144 are to be built. 700 w. Ry & Loc Engng—Dec., 1905. No. 73524 C.

Ten-Wheel Coupled Locomotive for the Great Western Railway of Argentina. Illustrations showing the general appearance and leading dimensions of an experimental locomotive to meet special conditions. 200 w. Engng—Nov. 24, 1905. No. 73601 A.

Ten-Wheeled (4-6-0) Locomotive for the New York Central & Hudson River. Illustrates and describes this type of locomotive, fifteen of which have been recently built for fast freight and heavy passenger service on the road named. 800 w. R R Gaz—Vol. XXXIX., No. 24. No. 73739.

The Capacity of Locomotives at Various Speeds (Ueber die Bestimmung der Leistungen von Lokomotiven aus dem Verlaufe der Geschwindigkeitskurven). Karl Schloss. A study of the tractive power of locomotives based upon the performance at various points in the speed curve. 3000 w. Zeitschr d Oesterr Ing u Arch Ver—Nov. 24, 1905. No. 73822 D.

The Compound Locomotive of To-day. J. F. Gairns. The present article is introductory and reviews the position occupied by the compound locomotive to-day. The principal systems in use will be considered. 2000 w. Prac Engr—Dec. 15, 1905. Serial. 1st part. No. 74041 A.

The Evolution and Development of the Steam Locomotive as Evidenced by the Exhibits in the Transportation Building at the St. Louis World's Fair. William A. Doble. Read before the Pacific Coast Ry. Club. An interesting illustrated review. 7800 w. Jour of Elec—Dec., 1905. Serial. 1st part. No. 73656 C.

The New Ten-Wheeled Express Locomotives of the Bavarian State Railways. E. Weiss. Gives a statement of the performances demanded, general arrangement and chief dimensions, with illustrated description. 2800 w. Bul Int Ry Cong—Nov., 1905. No. 73754 E.

The Origin of Four-Cylinder Balanced Compound Locomotives. Charles R. King. A review of designs of four-cylinder en-

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gines, and of balanced compounds, aiming to trace the first four-cylinder balanced compounds built. Ills. 4500 w. R R Gaz—Vol. XXXIX., No. 23. No. 73653.

The Recent Development of the Locomotive Engine. Calls attention to certain points in recent development, and the fact that the performance, economies and wastes cannot be treated on any basis of comparison drawn from the performance of stationary or marine engines. 3500 w. Engr, Lond—Dec. 1, 1905. No. 73691 A.

Balanced Compound Locomotives in Service. Sanford H. Fry. Gives illustrations and describes types of these engines, presenting results obtained in actual service. Short discussion. 5500 w. S & S-W Ry Club—Nov. 16, 1905. No. 74764 E.

Contractors' Locomotives. J. F. Gairns, Reviews the conditions governing the design and construction of such engines and their field of usefulness. Ills. 3000 w. Cassier's Mag—Jan., 1906. Serial. 1st part. No. 74465 B.

Development of the Steam Locomotive. Samuel Rendell. Abstract of a paper by one of the Manchester Assn of Engrs. A review showing the growth and alteration in general appearance and comparing with engines of fifty years ago. 4000 w. Mech Engr—Jan. 20, 1906. No. 74735 A.

Experimental Locomotives for the Pennsylvania Railroad. Illustrated descriptions of engines, two of each of five types having been ordered for experimental and observation purposes. 2200 w. R R Gaz—Vol. XL, No. 1. No. 74212.

Express Locomotive for the Malmö-Ystad Railway (Schnellzuglokomotive für die Bahn Malmö-Ystad). A. Doepfner. Illustrating a special locomotive, with snowplow attachment built by Borsig for a Swedish railway. 1000 w. 1 plate. Zeitschr d Ver Deutscher Ing—Jan. 6, 1906. No. 74606.

Four-Cylinder Locomotive for the Eastern Railway of France. H. W. Hanbury. Plate, illustration and description of a compound locomotive exhibited at the Liège Exhibition. 2200 w. Engng—Dec. 22, 1905. No. 74151 A.

Good's Locomotives on Foreign Railways. Charles S. Lake. Illustrated descriptions of types, noting features of special interest. 1500 w. Mech Engr—Dec. 23, 1905. Serial. 1st part. No. 74145 A.

Heavy American Type Locomotive, C. R. R. of N. J. Illustration, with brief description of a new heavy American type of locomotive with Walschaert valve gear. 500 w. Ry & Engng Rev—Jan. 13, 1906. No. 74375.

Heavy Eight-Wheeled Passenger Locomotive for the Central R. R. of New Jersey. Illustrated detailed description of exceedingly heavy engines of the 4-4-0 type, for passenger service over heavy grades and sharp curves. 1000 w. R R Gaz—Vol. XL, No. 3. No. 74453.

Latest Canadian Pacific 4-6-0. Illustration with description of a type of engine intended for passenger and freight service. 500 w. Ry & Loc Engng—Jan., 1906. No. 74200 C.

Mikado Type Freight Locomotives. Illustration and general data of engines built for the Deepwater Ry. Co. 300 w. Am Engr & R R Jour—Jan., 1906. No. 74104 C.

New Baltimore and Ohio Consolidation Locomotives. J. E. Muhlfeld. A statement of the features considered in the design, construction, operation, and maintenance of the E-27 class, with illustration and general dimensions. 2200 w. Am Engr & R R Jour—Jan., 1906. No. 74105 C.

New Compound Locomotives for the Great Central Railway. Illustrated description of an Atlantic (4-4-2) type three-cylinder compound passenger engine recently completed. 1000 w. Mech Engr—Jan. 20, 1906. No. 74733 A.

New Compound Locomotive on the Great Central Railway. Charles Rous-Marten. Discusses the three-cylinder compound engine just built from a design of J. G. Robinson for the fastest express service. Ills. 2500 w. Engr, Lond—Jan. 19, 1906. No. 74752 A.

Six-Coupled Engines on the Glasgow and South-Western Railway. Charles Rous-Marten. A large woodcut of this new type of engines, with drawings of the tender, and a discussion of the work of the engine. 4000 w. Engr, Lond—Jan. 5, 1906. No. 74423 A.

Six-Coupled Express Engine. Two-page drawing and brief description of bogie engine for heavy and fast service between Glasgow and Carlisle on the Glasgow & South-Western Ry. Particulars of the working will be given in the next issue. 700 w. Engr, Lond—Dec. 29, 1905. No. 74299 A.

Tendencies in Locomotive Building. Editorial on the features of this work during the past year. 1000 w. Ry & Loc Engng—Jan., 1906. No. 74199 C.

Thermal Storage Locomotive. Brief illustrated description of a radial tank locomotive of the 2-4-2 type belonging to the Lancashire and Yorkshire Railway, which has been fitted with the Druiitt-

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Halpin system of thermal storage. 300 w. Mech Engr—Jan. 6, 1906. No. 74402 A.

Atlantic Type Locomotives in Germany. Charles S. Lake. Illustrates types in use, and gives information of interest concerning them. 1400 w. Mech Engr—Feb. 3, 1906. No. 74984 A.

Compound Express Locomotive, G. N. R. Particulars and engravings of this engine, with 2-page supplement. 600 w. Engr., Lond—Jan. 26, 1906. No. 74891 A.

Decapod Locomotive for Mountain Grades on the Argentine Great Western Railway. Illustrated description of an engine designed to meet special conditions, and to operate on stretches of track where the rails are only of moderate weight. 700 w. Ry Age—Feb. 9, 1906. No. 74959.

Delaware & Hudson Locomotives with Young Valves and Gear. Illustrates and describes locomotives (4-6-0) intended for fast-freight service. 500 w. R R Gza—Vol. XL. No. 5. No. 74819.

De Pambour on Locomotive Engines. Concerning a valuable book published 70 years ago, and an account of how his information was obtained. 4000 w. Engr., Lond—Feb. 9, 1906. No. 75065 A.

Four - Cylinder Compound Locomotive for the Paris-Orleans Railway. Illustrations and dimensions. 400 w. Engng—Feb. 2, 1906. No. 74994 A.

French Compounds on the Great Western Railway. Charles Rous-Marten. A report of the performance of the two new locomotives of the du Bousquet-de Glehn "Atlantic" design, intended for the heaviest and fastest express duty. 4800 w. Engr., Lond—Feb. 2, 1906. No. 74997 A.

Heavy Banking Locomotive, Belgian State Railways. Illustrates and describes a very powerful four-cylinder duplex locomotive, closely imitating the Mallet system, built to assist trains up inclines. 1000 w. Engr., Lond—Feb. 2, 1906. No. 74999 A.

Light Locomotives and Small Trains (Leichte Lokomotiven und Kleinzüge). Hermann von Littrow. Illustrating several designs of small locomotives for special and local service on branches of the Austrian State Railways. 2000 w. Glasers Annalen—Feb. 15, 1906. No. 75140 D.

Links in the History of the Locomotive. Information concerning "The Novelty" engine, with illustrations. Also describes the "William the Fourth" locomotive. 2500 w. Engr., Lond—Jan. 26, 1906. No. 74888 A.

Locomotives with Flexible Wheel Base (Kurvenbewegliche Lokomotiven). E. Metzeltin. Illustrating and describing a 100-ton compound locomotive of the Mal-

let-Rimrott type for the Northern Railway of France. 2000 w. Zeitschr d Ver Deutscher Ing—Feb. 3, 1906. No. 75107 D.

Monon Passenger 4-6-2. Illustrated description of a new Pacific type passenger engine. 800 w. Ry & Loc Engng—Feb., 1906. No. 74858 C.

Powerful Six - Coupled Locomotives. Charles S. Lake. Illustration, with description of a 6-wheel coupled bogie, or 4-6-0 type of locomotive recently introduced on the Great Southern and Western Railway (Ireland). 800 w. Mech Engr—Feb. 10, 1906. No. 75082 A.

Tank Locomotives for the New South Wales Government Railways. Illustrated description of a six-coupled double-bogie tank engine specially designed for heavy suburban passenger service. 400 w. Engng—Feb. 14, 1906. No. 75290 A.

Compound Express Locomotive, Midland Railway. Two-page engraving showing a longitudinal section and sectional plan of the engine, with particulars of interest. 600 w. Engr, Lond—March 9, 1906. No. 75606 A.

Fast Passenger Locomotive for Heavy Service; Chicago, Milwaukee & St. Paul Ry. Illustration, with description of a design for a six-coupled engine of the Pacific type (4-6-2). A comparison with three other large engines is given. 1500 w. Eng News—March 15, 1906. No. 75521.

Heavy American Type Locomotive for the Central Railroad of New Jersey. Illustrated description of an 8-wheel passenger locomotive with Walschaert-valve motion. 500 w. Ry Age—March 16, 1906. No. 75576 .

Large Electric and Steam Locomotives. J. E. Muhlfeld. Gives a comparison of the performance of electric and steam locomotives in actual service, and discusses the requirements and results, and all matters of related interest. An important paper, with an interesting discussion. 17500 w. Pro N Y R R Club—Feb. 16, 1906. No. 75536.

New Locomotives, London, Brighton and South Coast Railway. Charles Rous - Marten. Illustration with remarks on the novel features, giving principal dimensions. 2000 w. Engr, Lond—Feb. 23, 1906. No. 75375 A.

Six-Coupled Tank Locomotive; Furness Railway. Illustrated description of a powerful 6-wheels coupled radial-tank engine, to be used for hauling heavy trains. 500 w. Mech Engr—March 17, 1906. No. 75699 A.

Consolidation Locomotive for the Boston & Maine. Illustrations, principal di-

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mensions, and particulars of 2-8-0 locomotives with Walschaert valve gear. 300 w. Ry Age—April 20, 1906. No. 76167.

Culm Burner for the D., L. & W. Illustrated description of engines with the Wootten type of wide firebox. 600 w. Ry & Loc Engng—May, 1906. No. 76376 C.

Details of the A. C-D. C. Locomotives for the New York, New Haven & Hartford Railroad. Describes the electric locomotives for operation on the direct-current division between the Grand Central station and Woodlawn, and on the alternating-current portion of its line between Woodlawn and Stamford. Ills. 3000 w. R R Gaz—April 13, 1906. No. 76046.

First Swedish Superheater Locomotive. Dr. Alfred Gradenwitz. Brief illustrated description of the type of apparatus used, and a record of some comparative trials. 1000 w. Ry Age—April 20, 1906. No. 76170.

Mallet Compound Duplex Locomotives for the Guayaquil & Quito Railway. Illustrations with dimensions and notes. 500 w. Eng News—April 12, 1906. No. 76052.

New Atlantic-Type Locomotives. Photograph and particulars of new Atlantic (4-4-2) type express passenger locomotives for the London, Brighton, and South Coast Ry. 700 w. Mech Engr—March 31, 1906. No. 76002 A.

New Compound Express Locomotives; Midland Railway. Charles S. Lake. Illustration, principal dimensions, and particulars of interest. 800 w. Mech Engr—April 7, 1906. No. 76070 A.

Pacific Type Passenger Locomotive. Illustrates and describes some powerful locomotives built for the Southern Railway. 500 w. Am Engr & R R Jour—April, 1906. No. 75853 C.

Recent High-Speed German Locomotives (Neuere Deutsche Schnellzuglokomotiven). M. Michter. Discussing especially the modern four-cylinder compound engine of the de Glehn type, with diagrams of speed performance. Serial. Part I. 3000 w. Zeitschr d Ver Deutscher Ing—April 14, 1906. No. 76208 D.

Score: 84 Not Out. Illustrated description of an engine, still at work on the Northeastern Railway of England, which was built in 1822. 1000 w. Ry & Loc Engng—April, 1906. No. 76023 C.

Single Expansion 4-6-2 for the O. S. L. Illustrated description of a Prairie type engine for the Oregon Short-Line. 700 w. Ry & Loc Engng—May, 1906. No. 76373 C.

Ten-Wheel Freight Locomotive for James Bay Railway. Illustration with description of the special features. 1000 w. Can Engr—April, 1906. No. 75921.

The Actual Efficiency of a Modern Locomotive Represented by Work Actually Performed, Compared with the Lighter Locomotives, of Twenty Years Ago. William Penn Evans. A comparison between the locomotives of the present and those built twenty years ago, as to efficiency, cost, reliability, etc. 5000 w. Pro Pacific C Ry Club—Feb. 17, 1906. No. 75924 C.

The Cole Four-Cylinder Balanced Compound. G. M. Basford. Reviews an interesting line of development of passenger locomotives showing the progress toward very powerful engines and in the Cole four-cylinder Compound, with illustrations. The advantages of the compound are stated and of balancing. 9000 w. Pro S & S-W Ry Club—Jan., 1906. No. 76093 E.

The Large Locomotive. G. M. Basford. Remarks on the rapid advance in weight and power, their service, efficiency, maintenance, etc. 5000 w. Pro Pacific C Ry Club—Feb. 17, 1906. No. 75925 C.

The latest Great Northern Engines. Charles Rous-Marten. A report of actual work done by these Ivatt locomotives, a compound, and two non-compounds. 2500 w. Engr, Lond—March 31, 1906. Serial. 1st part. No. 76016 A.

The Mellin Compound. Hal R. Stafford. An illustrated description of this two-cylinder compound in its latest form with an outline of the history of this type. 2000 w. Am Engr & R R Jour—April, 1906. No. 75850 C.

A Comparative Test Between a Simple and Compound Locomotive. A thesis submitted for the degree of Bachelor of Science in Mechanical Engineering, University of Wisconsin. Describes tests made. Plates. Discussion. 14800 w. Pro W Ry Club—April 17, 1906. No. 76693 C.

British Locomotives in 1905. Charles Rous-Marten. A review of the designs and work. Ills. 6800 w. Bul Int Ry Cong—April, 1906. No. 76949 E.

Comparison of the Wear of Wheel Tires of Locomotives with inside and with Outside Cylinders. O. Busse. Showing the advantages of inside cylinders. Tables and Ills. 1300 w. Bul Int Ry Cong—April, 1906. No. 76951 E.

Compound Locomotives. G. R. Sisterston. Considers the things upon which the success of compound systems depend,

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and describes a form of this system in which there are four equal cylinders, one high and three low pressure. 2000 w. Engr, Lond—April 27, 1906. No. 76577 A.

Conversion of the Great Eastern Decopod. Reviews the history of this English locomotive, and gives an account of the use made of it. 1200 w. Engr, Lond—April 20, 1906. No. 76450 A.

Locomotives with Special Valve Gears (Lokomotiven mit Ventilsteuerung). E. Metzeltin. Describing special gears for locomotives using piston, Corliss, and similar valves, with especial reference to the locomotives of the Hanover Machine Works. Serial. Part I. 7500 w. Zeitschr d Ver Deutscher Ing—April 28, 1906. No. 76801 D.

Norfolk & Western 4-6-2 Locomotive. Illustrates and describes the principal features of interest. 400 w. Ry Age—May 4, 1906. No. 76534.

Note on the Calculation of the Loads Hauled by Locomotives and on the Determination of the Time Required for Running in Ordinary Service. O. Busse. 2000 w. Tables. Bul Int Ry Cong—April, 1906. No. 76950 E.

Standardizing Locomotive Equipment. Describes the Standard locomotive parts adopted by the Canadian Pacific Railway. 1200 w. Am Engr & R R Jour—April, 1906. Serial. 1st part. No. 76466 C.

Balanced Compound Locomotives. H. V. Wille. An illustrated article discussing features of these engines, which the writer considers the highest type produced. 1800 w. R R Gaz—June 15, 1906. No. 77281.

Baltimore & Ohio Railroad Motive Power. Descriptions and Illustrations of recent types of steam and electric freight, passenger and switching locomotives. 1500 w. R R Gaz—June 15, 1906. No. 77278.

Care and Maintenance of Freight and Passenger Engines at Terminal to Give Maximum Mileage and Efficient Service. E. T. James. A detailed consideration of this subject, followed by general discussion. 12700 w. Pro N Y R R Club—May 18, 1906. No. 77291.

Consolidation Locomotive for the New York Central Lines. An illustrated detailed description, with dimensions. 1200 w. R R Gaz—June 15, 1906. No. 77277.

De Glehn 4-4-2 on the Pennsylvania. Illustration, with brief description of a compound engine built in France. It is of the Atlantic type and fitted with Walschaert valve gear. 600 w. Ry & Loc Engng—June, 1906. No. 77105 C.

Fairlie Locomotive for the Bolivian Railways (2-ft. 6-in. Gauge). Illustrated description with principal dimensions. 900 w. Engng—June 8, 1906. No. 77387 A.

4-6-2 Passenger for the N. & W. An illustrated description of a single expansion 4-6-2 engine for the Norfolk & Western, for passenger service. 900 w. Ry & Loc Engng—June, 1906. No. 77103 C.

Lake Shore Heavy Passenger Locomotive. Illustrations, with dimensions of a 2-6-2 engine, said to be the heaviest passenger locomotive ever built. 400 w. Ry Age—June 1, 1906. No. 77085.

Latest Express Engines—Southeastern and Chatham Railway. Charles Rous-Marten. Illustrated description and dimensions of the latest design of Mr. Harry S. Wainwright, and an account of the work they are expected to perform is given in the present number. 2200 w. Engr, Lond—June 8, 1906. Serial. 1st part. No. 77389 A.

New York Central Electric Locomotives. Reginald Gordon. Presents a detailed description of these locomotives. Ills. 2000 w. R R Gaz—June 15, 1906. No. 77282.

Pacific Locomotive for the Southern Railway. Illustrated description of recently built (4-6-2) locomotives for passenger and fast freight service. 500 w. R R Gaz—June 29, 1906. No. 77537.

Pacific Type Passenger Locomotives. Remarks on this type of engine, illustrating the two kinds of trailing trucks used, and giving a table of the principal dimensions of several Pacific type passenger locomotives. 1500 w. Ry Mas Mech—June, 1906. No. 77181.

Prairie Type Passenger Locomotive with Walschaert Valve Gear. Illustrated description of a type of heavy passenger engines which are in service on the L. S. & M. S. Ry. 900 w. Am Engr & R R Jour—June, 1906. No. 77113 C.

Recent Baldwin Locomotives. Illustrations of a 2-8-2 and a 2-6-2 type, with brief descriptions. 600 w. Ry Age—June 8, 1906. No. 77204.

Recent Development of American Passenger Locomotives. George L. Fowler. An interesting illustrated review of locomotive development. 3000 w. R R Gaz—June 15, 1906. No. 77280.

Simple Consolidation Locomotive with Walschaert Valve Gear. Illustrated description of the design known as Class H 6 B, for use on the Pennsylvania R. R. 800 w. Am Engr & R R Jour—June, 1906. No. 77120 C.

Simple Four-Cylinder Passenger Loco-

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motive with Superheater. Illustrated description of a heavy, balanced, ten-wheel engine for the Belgian State Railways. 1500 w. *Am Engr & R R Jour*—*Jur*, 1906. No. 77117 C.

Some Recent Designs of Tank Locomotives. Photographs and particulars of three different types designed for specified service. 1200 w. *Mech Engr*—June 2, 1906. No. 77260 A.

The Development and Present Status of the Compound Locomotive in the United States. Editorial review of the history of the compound locomotive in the United States, with discussion of the work for which it is suited. 2000 w. *Eng News*—June 21, 1906. No. 77416.

American Experience with Compound Locomotives. Remarks on the railways using large numbers of compounds and their service. 1700 w. *Engr, Lond*—July 20, 1906. No. 78314 A.

An Interesting Locomotive Conversion. Illustrations showing the changes made in reconstructing a three-cylinder compound (Webb's system) 0-8-0 type mineral locomotive to a simple engine. 1400 w. *Mech Engr*—June 23, 1906. No. 77782 A.

Baldwin Locomotives for the Union Pacific and Great Northern Railways. Illustrated descriptions of two locomotives exhibited at Atlantic City during the recent convention of the Am. Ry. Mas. Mech's Assn. 1100 w. *Ry Age*—July 20, 1906. No. 78095.

Baltimore & Ohio Railroad Motive Power. Illustrates and describes the latest addition to the locomotive equipment, consisting of some very heavy and powerful Pacific type engines. 1500 w. *Am Engr & R R Jour*—July, 1906. No. 77760 C.

Lake Champlain & Moriah 2-8-2. Illustrated description of an engine designed to work on 4° grades and to pass around 14 deg. curves. 800 w. *Ry & Loc Engng*—July, 1906. No. 77863 C.

Locomotive for the Hungarian State Railways. Illustrated description of a four-cylinder compound, four-coupled wheel, 4-4-2 type engine shown at the Milan Exhibition. 1300 w. *Engng*—July 20, 1906. No. 78309 A.

Locomotive Improvements: L. & N. W. Railway. Charles S. Lake. Considers alterations made in types of locomotives, raising the boiler power, adding extra wheels, etc. 1000 w. *Mech Engr*—July 21, 1906. No. 78303 A.

Mogul Locomotives for the Panama Excavation. Illustrates and describes two designs to be used in the construction of the Panama Canal. 120 have recently

been completed. 800 w. *R R Gaz*—July 20, 1906. No. 78056.

Mountain Climber in Upper Burma. Brief illustrated description of an engine used on the Darjiling-Himalayan railway, a narrow gauge road 24 ins. wide. 400 w. *Ry & Loc Engng*—July, 1906. No. 77866 C.

New Locomotives for Mixed Driving on the Brünig Railway (Neue Lokomotiven der Brünigbahn für Gemischten Betrieb). Illustrating four-cylinder compound engines for adhesion and rack-railway service on the railway over the Brünig pass, in Switzerland. 1200 w. *Schweiz Bauzeitung*—June 16, 1906. No. 78140 B.

Pittsburg and Lake Erie Switching Locomotive. Illustrated description of a type of engine for use in the gravity yards to push heavy trains up the "hump." 700 w. *Ry Age*—July 27, 1906. No. 78292.

Rack Locomotive for Manitou and Pike's Peak Railway. Illustrated description of some new engines for this road, which is operated on the Abt rack-rail system, with a maximum grade of 25 per cent. 700 w. *R R Gaz*—July 13, 1906. No. 77949.

Recent de Glehn System Compound Locomotives. Illustrations and particulars of recent types of engines, compounded on the de Glehn system, and supplied to French and German railways. 1600 w. *Mech Engr*—July 14, 1906. No. 78207 A.

Simple Consolidation Locomotive with Walschaert Valve Gear. Illustrated description of a new design for the L. S. & M. S. R. R. 700 w. *Am Engr & R R Jour*—July, 1906. No. 77761 C.

Six-Coupled Passenger Express Locomotive; Caledonian Railway. Illustrated description of engines especially built for the Grampian express service. 800 w. *Engng*—June 22, 1906. No. 77796 A.

A Remarkable German Locomotive. Illustrated description of the high speed 4-4-4 type compound locomotive for the Bavarian State Railways. 700 w. *Mech Engr*—Aug. 11, 1906. No. 78663 A.

Balanced Compound Atlantic Type Locomotive. Illustrated description of engines for the Union Pacific Railroad. A new design of crank axle has been used. 600 w. *Am Engr & R R Jour*—Aug., 1906. No. 78412 C.

Belgian and French Locomotives at the Liège Exhibition. Gives particulars of some of the most interesting engines, with sectional views. 1800 w. *Eng News*—Aug. 23, 1906. No. 78688.

Derailment of Ten-Wheel Engines. W. A. Nettleton. Reports investigations tending to show that these engines are

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quite as safe as any others, and that it is the relation of the engine to the track which causes the trouble. 2000 w. Ry & Loc Engng—Aug., 1906. No. 78383 C.

Duplex Locomotives. Brief notes on types of duplex locomotives, with illustrated description of a Fairlie double-truck double-boiler type recently built for a railway of 30 ins. gauge in Bolivia. 1400 w. Eng News—Aug. 9, 1906. No. 78535.

Four Cylinder Balance Simple Locomotive. Illustrated description of an inspection engine for the L. S. & M. S. Ry., which is the first locomotive of this type to be built in the United States. 1300 w. Am Engr & R R Jour—Aug., 1906. No. 78408 C.

Four-Cylinder Compound Rack-Adhesion Locomotive; Benguela Railway, Portuguese West Africa. Brief illustrated description of a type of locomotive arranged for working either on ordinary track, by adhesion, or on the rack section of the line. 800 w. Engng—Aug. 10, 1906. No. 78675 A.

Four-Cylinder Express Locomotive, G. W. R. Illustration, with brief description of a new type of four-cylinder non-compound express locomotive. 300 w. Engr, Lond—Aug. 17, 1906. No. 78859 A.

Heavy Switching Locomotive for the Pittsburg and Lake Erie. Illustrated description of a very heavy six wheel (0-6-0) switching locomotive, giving principal dimensions. 500 w. R R Gaz—Aug. 3, 1906. No. 78417.

Heavy 2-8-0 for Cuba. Illustrates heavy consolidation engines recently purchased by the Western Railway of Havana. 600 w. Ry & Loc Engng—Aug., 1906. No. 78382 C.

High-Speed Bavarian Locomotive. Illustrated description of an engine designed for running normally at 94 miles per hour. 700 w. Engr, Lond—July 27, 1906. No. 78477 A.

New Northern Pacific Power. Illustrates and describes the three types of locomotives in a recently completed order for 70. All are simple engines and the boilers of all contain a full combustion chamber. The details are described and other information given. 1800 w. Ry & Engng Rev—Aug. 25, 1906. No. 78830.

Pacific and Prairie Type Locomotives. Remarks on these types as used on the C. B. & Q. Ry. Illustrating and describing recent engines, and the changes introduced. 1000 w. Am Engr & R R Jour—Aug., 1906. No. 78409 C.

Texas & Pacific 4-4-2. An illustrated article giving information concerning this recently built engine and the newly built erecting shop at Marshall, Tex. 600 w. Ry & Loc Engng—Aug., 1906. No. 78384 C.

The Efficiency of the Steam Locomotive (Das Leistungsgebiet der Dampf-lokomotive). R. Sanzin. A discussion of tests on the Austrian railways with numerous curves showing performances under different working conditions. Two articles. 6000 w. Zeitschr d Oesterr Ing u Arch Ver—Aug. 3, 10, 1906. No. 78725, each D.

Consolidation Locomotives with All-free-Hubbell Cylinders and Valves. Describes a practical test made on two locomotives, identical in every respect except cylinders and valves, showing the effect on tonnage hauled and cost of operation due to the difference in the steam distribution. 1500 w. Am Engr & R R Jour—Sept., 1906. No. 78950 C.

Goods Locomotive for the Caledonian Railway. Illustration, diagram, and description. 500 w. Engng—Aug. 31, 1906. No. 79144 A.

Heavy Six-Wheel Switching Locomotive. Illustrated description of an engine for the Pittsburg & Lake Erie railroad, having a total weight of 176,500 lbs. 500 w. Am Engr & R R Jour—Sept., 1906. No. 78952 C.

Light Eight-Wheel Switching Locomotive. Illustrated description of switching engine for the East Tennessee & Western North Carolina Railroad. 500 w. Ry Age—Aug. 31, 1906. No. 78959.

Links in Locomotive Development. Gives three diagrammatic illustrations of typical Great Northern locomotives at successive periods in the history of that railway, together with details of their seating dimensions. 1000 w. Engr, Lond—Aug. 24, 1906. No. 79013 A.

Mallet Duplex Compound Freight Locomotives for the Great Northern Ry. Illustration, with description and general dimensions. 900 w. Eng News—Sept. 27, 1906. No. 79469.

Modern Locomotive Construction in Belgium. Remarks on the Milan exhibits of Belgian locomotives, and an illustrated description of the La Meuse four-cylinder engine and other types. 3500 w. Engr, Lond—Sept. 7, 1906. No. 79237 A.

New Tank Locomotives, London and Northwestern Railway. Illustrated description of a new type of tank engine. 600 w. Mech Engr—Aug. 25, 1906. No. 78992 A.



# RAILWAY ENGINEERING

## Locomotives

## MOTIVE POWER AND EQUIPMENT

## Locomotive Tests

Pacific Type Passenger Locomotive. Illustrated detailed description of engines for the Norfolk & Western Railway. 1000 w. Am Engr & R R Jour—Sept., 1906. No. 78954 C.

Some Interesting Types of Locomotive Development. Illustrations, principal dimensions, and information relating to recent types put in service. 1800 w. Ry Mas Mech—Sept., 1906. No. 79025.

Tank Locomotive Fitted with Lentz Reversing Gear and Poppet Valves. Illustrated description of an engine exhibited at Milan, having the poppet valves placed horizontally, and a new type of reversing gear which dispenses with the link. 600 w. Ry Age—Sept. 14, 1906. No. 79195.

The Development of the de Glehn System Compound Locomotive in France. Charles S. Lake. An illustrated review covering a period of 15 years, from 1891 to 1906. 2000 w. Mech Engr—Sept. 15, 1906. Serial. 1st part. No. 79440 A.

The Lake Shore Four-Cylinder Simple Inspection Locomotive. Data and illustrated description. 1000 w. R R Gaz—Sept. 7, 1906. No. 79100.

Thirty years of Compound Locomotive Practice. Reviews the origin and history of the compound locomotive. Also editorial. 4500 w. Engr, Lond—Sept. 14, 1906. No. 79452 A.

American Tank Locomotives for Japan. Illustration, with description, of engines recently built at Schenectady. 400 w. Ry & Engng Rev—Oct. 27, 1906. No. 80117.

Compound Locomotive for the Northern Railway of France. H. W. Hanbury. Plate and description of this engine and its performance. 2000 w. Engng—Oct. 12, 1906. No. 80057 A.

Details of Four-Cylinder Compound Six-Coupled Locomotive. Illustrated detailed description of a locomotive for the Italian State Railways, shown at the Milan exposition. 1000 w. Engng—Sept. 28, 1906. Serial. 1st part. No. 79705 A.

Freight and Passenger Locomotives with Combustion Chambers. Illustrations of types representing 70 locomotives recently delivered to the Northern Pacific Railway Company, with descriptive notes. 1700 w. Am Eng & R R Jour—Oct., 1906. No. 79602 C.

Latest Express Engines—South-Eastern and Chatham Railway. Charles Rous-Marten. An account of the performance of these engines in regular daily service. 2500 w. Engr, Lond—Oct. 5, 1906. No. 79806 A.

Mallet Articulated Compound Locomo-

tive, Type 2-6-6-2. Illustrated detailed description of locomotives for the Great Northern Railway, which are the heaviest locomotives yet built. 2500 w. Am Engr & R R Jour—Oct., 1906. No. 79600 C.

New Delaware & Hudson Consolidation Locomotives. Illustrated detailed description of heavy locomotives designed for slow freight and pushing service. 800 w. Ry & Engng Rev—Oct. 6, 1906. No. 79646.

New 4-Cylinder Compound Locomotives: Danish State Railways. Charles S. Lake. Drawings and description of large engines of the Atlantic type, with leading dimensions. 800 w. Mech Engr—Oct. 6, 1906. No. 79790 A.

Standardizing Locomotives on the American Railways. A description dealing with the methods and plans adopted in standardizing the locomotive equipment of the system formed by the Southern Pacific Railway and the Union Pacific Railway, and subsidiary lines. 3000 w. Engr, Lond—Oct. 5, 1906. No. 79805 A.

The Compound Locomotive in the Twentieth Century. J. F. Gairns. Considers the work for which these locomotives are suited, the various systems and their general characteristics. 2000 w. Cassier's Mag—Oct., 1906. No. 79530 B.

The Development of American Freight Locomotives. George L. Fowler. An illustrated article giving an outline of improvements made to increase the capacity during the last 25 years. 3000 w. R R Gaz—Oct. 19, 1906. No. 79868.

The Economical Working of Locomotives. William Ernest Dalby. Investigates the economical working and design of locomotives of the simple type. 4000 w. Inst of Civ Engrs—No. 3577. No. 79521 N.

Vauclain Balanced Compound Locomotive for the Chicago and Eastern Illinois Railroad. Illustrates and describes this engine, reporting a test made in comparison with a single-expansion locomotive. 1500 w. Engng—Sept. 21, 1906. No. 79586 A.

## Locomotive Tests.

Comparisons Between the Efficiencies of an American and an Austrian locomotive (Vergleich der Leistungen fähigkeit einer Amerikamschen mit einer Oesterreichischen Lokomotive). R. Sanzin. The data for the American engine are taken from the P. R. R. tests at St. Louis; the Austrian data are from road trials on the Arlberg division of the Austrian State Railways. 7500 w. Zeitschr d Oesterr

# RAILWAY ENGINEERING

## Motor Cars

## MOTIVE POWER AND EQUIPMENT

## Motor Cars

Ing u Arch Ver—Feb. 16, 1906. No. 75731. D.

Report of Committee Appointed to Co-operate with the Pennsylvania Railroad System in Conducting Tests of Locomotives at the Louisiana Purchase Exposition. 7200 w. Am Soc Mech Engrs, No. 092—May, 1906. No. 76103 C.

Record of the Pennsylvania Locomotive Tests. Editorial review of the final record of the tests made at the Louisiana Purchase Exposition, giving the summary of conclusions. 2000 w. R R Gaz—Vol. XL. No. 6. No. 74946.

The Tests of Locomotives at the St. Louis Exhibition, 1904. Gives some of the special features of these tests, for purposes of comparison, with general information of interest. Also editorial. 6000 w. Eng News—Feb. 15, 1906. No. 75017.

## Motor Cars.

Rail Motor Carriage. A. F. Sinclair. Illustrated description of Cochran's steam motor as used on the Great North of Scotland railway. 700 w. Ry & Loc Engng—Feb., 1906. No. 74856 C.

The Strang Gasolene-Electric Rail Motor Car. Illustrated description of an experimental car now on trial. 800 w. R R Gaz—Vol. XL. No. 8. No. 75242.

Railway Automobiles (Motorlokomotiven). F. Kramer. With illustrations of gasoline and petroleum automobile cars for use on railways, with especial reference to the machines of the Otto works at Deutz, opposite Cologne. 4000 w. Zeitschr d Ver Deutscher Ing—April 7, 1906. No. 76205 D.

A New Steam Rail Motor Car. Illustrated description of a new design with a statement of the advantages claimed. The car is built by James T. Halsey, Philadelphia. 1200 w. R R Gaz—June 8, 1906. No. 77228.

A Petrol-Electric Rail Motor Car. Illustrates and describes an interesting type of petrol-electric motor car introduced by De Dion Bouton, Ltd. 1000 w. Tram & Ry Wld—June 7, 1906. No. 77401 B.

Benzine-Electric Railway Motor Car. (Benzinelektrische Selbstfahrer im Eisenbahnbetriebe). Jaromir Krizko. A combination railway motor car, with a dynamo driven by a combustion engine, delivering current to electric motors on the axles. Data and results of operative tests are given. 5000 w. Zeitschr d Oesterr Ing u Arch Ver—June 8, 1906. No. 77617 D.

Gasolene Motor Cars. W. R. McKeen, Jr. Describes the motor cars of the Un-

ion Pacific Railroad, and reports their performance. 2000 w. R R Gaz—June 15, 1906. No. 77283.

The Esslingen Railway Motor Car (Der Eisenbahnmotorwagen der Maschinenfabrik Esslingen). A. Heller. Describing an independent steam motor-car, with vertical boiler, and superheater, and space for 16 seats, and a luggage compartment. Speeds of 56 kilometers per hour are attained. 1800 w. 1 plate. Zeitschr d Ver Deutscher Ing—June 2, 1906. No. 77604 D.

Steam Motor Car for the Canadian Pacific. Illustrated description of an oil-burning steam motor car in service on this line. 600 w. R R Gaz—July 20, 1906. No. 78055.

Railway-Motor-Car Traffic. T. Hurry Richards and Sidney B. Haslam. Deals with the use of these cars for local and branch line traffic, discussing the commercial as well as the engineering side of the question. Illustrates and describes cars used. 4000 w. Inst of Mech Engrs—July 30, 1906. No. 78562 D.

Gasoline Motor Car for Main-Line Service (Automotrice à Essence de Pétrole pour Voie Ferrée Normale). S. Herzog. Illustrating the motor of the Orion Works, at Zurich, with details of the engine and running gear. 1000 w. 1 plate. Génie Civil—July 14, 1906. No. 78717 D.

Railway Motor-Carriage (760-Millimeter Gauge); Milan Exhibition. Illustrated detailed description of two steam motor-carriages, representing types in use on Austrian railway lines. 800 w. Engng—Sept. 7, 1906. No. 79235 A.

Steam Motor Car. Illustrated detailed description of a car recently placed in operation on the Canadian Pacific Railway. 800 w. Am Engr & R R Jour—Sept., 1906. No. 78949 C.

Bavarian Rail Motor-Coach. Illustrates and describes this steam coach and its equipment. 700 w. Engr, Lond—Oct. 12, 1906. No. 80062 A.

Rail-Motor-Car Traffic in England. T. H. Riches and S. B. Haslam. From a paper presented at meeting of the Inst. of Mech. Engrs. Information concerning this means of dealing with local and branch line passenger traffic, and related matters. Ills. 4000 w. R R Gaz—Oct. 12, 1906. No. 79748.

The Kobusch-Wagenhals Steam Motor Car. Illustrated detailed description of an unusually large and heavy steam motor car. 600 w. Ry Age—Sept. 28, 1906. No. 79565.

# RAILWAY ENGINEERING

## Motor Coaches

### Motor Coaches.

Recent Developments in Motor Coaches Upon British Railroads. Illustrates and describes some recent types, especially the Peebles Steam Car. 2000 w. Sci Am Sup—Dec. 2, 1905. No. 73555.

### Oscillations.

The Oscillations of Railway Vehicles on Entering and Leaving Curves (Les Oscillations du Matériel des Chemins de Fer à l'Entrée en Courbe et à la Sortie). Georges Marié. An exhaustive mathematical and practical study of the action of centrifugal and inertia forces to produce oscillations. 10000 w. Mem Soc Ing Civ de France—Nov., 1905. No. 75728 G.

### Pipe Connections.

Diagram of Pipe Connections—"E T" Engine and Tender Equipment. Gives illustrations showing the pipe connections and the internal construction of the various valves, with descriptive notes of the working. 2500 w. Ry & Loc Engng—April, 1906. No. 76024 C.

### Power House.

See Electrical Engineering, Generating Stations.

### Railway Automobiles.

Petrol Automotor for Railway Service (Draisine à Pétrole pour Voies Ferrées). An illustrated description of the Campagne car, designed for inspection service and light emergency traction on the French railways in Tunis. 1200 w. Génie Civil—Dec. 23, 1905. No. 74628 D.

Wolseley 140 H. P. Railroad Car Motor. Illustrated description of an engine having six opposed cylinders, now installed in an experimental self-propelled coach at the Schenectady shops of the General Electric Co. 1500 w. Automobile—Jan. 4, 1906. No. 74203.

### Repairs.

The Cost of Locomotive Repairs per 1,000-Ton Miles. Harrington Emerson. Does not consider it safe to generalize under existing conditions, suggesting the best way to cheapen engine repairs. 700 w. Am Engr & R R Jour—Nov., 1905. No. 72945 C.

Locomotive Repair Schedule. C. J. Morrison. Gives an erecting floor schedule for light, heavy, and general repairs in a shop operated by the gang method, explaining the system. 1500 w. Am Engr & R R Jour—Sept., 1906. No. 78951 C.

### Regulating Valves.

The Dimensions of the Openings for Locomotive Regulating Valves (Ueber die Grösse der Lokomotive-Regulator Ein-

## MOTIVE POWER AND EQUIPMENT

strömöffnung). A. Langrod. A mathematical examination of the flow of steam through regulating valves in accordance with the modern theory of Gutermuth. 2000 w. Glasers Annalen—Jan. 1, 1906. No. 74615 D.

### Rolling Stock.

Specification for Material Used in the Construction of Railway Rolling Stock. Deals with the important specifications just issued by the Engineering Standards Committee, considering axles in the present number. 1600 w. Ir & Coal Trds Rev—Sept. 7, 1906. Serial. 1st part. No. 79245 A.

### Speed Curves.

Note on Determining the Power of Locomotives by Means of the Speed Curves. Dr. Karl Schlöss. Abstract translation. Explanatory. 2800 w. Bul Int Ry Cong—Sept., 1906. No. 79891 E.

### Speed Indicator.

The Flamm Speed Indicator. Illustrated description of an apparatus designed to record automatically the speed of a locomotive attained throughout the run. 800 w. R R Gaz—Sept. 21, 1906. No. 79406.

### Stability.

Stability of Trains on a Track of 0-60 Metre Gauge (La Stabilité des Trains; La Voie de Om. 60). Col Péchot. Discussing especially the availability of track of about 24-inch gauge for military purposes, including details of construction and operation. 25,000 w. 1 plate. Ann des Ponts et Chaussées—2 Trimestre, 1905. No. 75771 E & F.

### Stay-Bolts.

Stay-Bolt Practice of the Pennsylvania Railroad. Illustrates and describes improvements introduced by A. W. Epright, giving results. 1700 w. Am Mach—Vol. 29. No. 13. No. 75861.

### Steam-Coach.

Steam-Coach for Central South African Railways. Gives engravings showing the manner in which an existing suburban coach was converted into a motor-coach. Short description. 300 w. Engng—July 27, 1906. No. 78474 A.

### Stoker.

The Hayden Mechanical Stoker. Illustrated description of a stoker for use on the large locomotives of the present, its operation and test. 4500 w. R R Gaz—Vol. XL, No. 9. No. 75317.

### Superheater.

Vaughan-Horsey Superheater. Illustrates and describes a new type of superheater being tested by the Canadian Pacific Railway. 1000 w. Am Engr & R R Jour—Feb., 1906. No. 74850 C.

# RAILWAY ENGINEERING

## Superheating

## MOTIVE POWER AND EQUIPMENT

## Train Lighting

### Superheating.

**Locomotive Superheaters**—Practical Difficulties in the Use of Superheated Steam. Remarks recently made by W. F. M. Goss, reviewing the early and recent developments in the use of superheated steam. 2000 w. *Sci Am Sup*—May 19, 1906. No. 76689.

**Superheated Steam on the Canadian Pacific Railway.** H. H. Vaughan. Describes the progress made during the last year in the application of superheated steam to locomotives on the Canadian Pacific Railway, discussing the results. Also general discussion. Ills. 12400 w. *Pro N Y R R Club*—April 20, 1906. No. 76794.

**Superheated Steam on the Canadian Pacific Railway.** Editorial review of the paper presented by H. H. Vaughan before the N. Y. R. R. Club. 3000 w. *Am Engr & R R Jour*—May, 1906. No. 76468 C.

**Ten-Wheel Coupled Locomotive for Argentina.** Two-page engraving and illustrated description of details of this interesting engine. 1000 w. *Engng*—May 18, 1906. No. 77012 A.

### Tender.

**Locomotive Tender.** Sections and description of a tender for the Chicago & Northwestern railway having a capacity for 7500 gals. of water and 10 tons of coal. 500 w. *Am Engr & R R Jour*—Sept., 1906. No. 78953 C.

### Testing Plant.

**Locomotive Testing Plant at Swindon** Drawings and photographs illustrating the plant of the Great Western Railway, England, with description of the mechanism. 2000 w. *Engr, Lond*—Dec. 22, 1905. No. 74158 A.

### Tractive Power.

**Tests on the Tractive Power of Locomotives** (Untersuchungen über die Zugkraft von Lokomotiven). Dr. Rudolf Sanzin. A comparison of drawbar tests at high speeds upon various European and American lines, plotting the results in curves. 5000 w. *Zeitschr d Ver Deutscher Ing*—Jan. 27, 1906. No. 75105 D.

**Some Slippery Engines.** Editorial, explaining the causes of slipping, and showing that, while sometimes the result of design, is always caused when the maximum tractive effort exceeds the frictional limit. 1500 w. *Ry & Loc Engng*—May, 1906. No. 76374 C.

### Traction.

**The Influence of the Tractive Effort upon the Distribution of Weight in Locomotives** (Influence de l'Effort de Trac-

tion sur la Répartition de la Charge des Locomotives). F. Maison. Showing that the distribution of weight upon the driving wheels is variable, and considering the case of double traction and the effect of braking. 5500 w. *Rev Gén d Chem de Fer*—Oct., 1906. No. 79925 G.

### Train.

**South-Eastern & Chatham Express Train.** Engraving and description of a fine British express train. 900 w. *Loc Engng*—Nov., 1905. No. 72930 C.

### Train Heating.

**The Heating of Railway Trains** (Heizung der Eisenbahnwagen). E. Ritt. Illustrated details of steam heating apparatus as used in German railway trains. 1800 w. *Gesundheits-Ingenieur*—Nov. 10, 1905. No. 73876 B.

### Train Lighting.

**The L'Hoest and Pieper System of Electric Train Lighting** (Die Elektrische Zugbeleuchtung von L'Hoest und Pieper). E. Wikander. A steam-driven generating set is mounted on the locomotive boiler, the current being regulated on each car, and a small storage battery supplying current for three hours in case of detachment. 1800 w. *Elektrotech Zeitschr*—Nov. 16, 1905. No. 73852 B.

**The L'Hoest-Pieper System of Train Lighting.** Describes this system which aims to eliminate the axle-driven generator, and to reduce the equipment of each car to a small battery just sufficient for lighting the car in case it is disconnected from the locomotive. 800 w. *Elec Wld & Engr*—Dec. 2, 1905. No. 73614.

**The Mixed System of Electric Train Lighting** (Elektrische Beleuchtung von Personenwagen nach dem Gemischten Betrieb). Emil Dick. A comparison of the use of storage batteries and of the mixed system of dynamo and storage battery for the lighting of passenger trains. 4000 w. *Zeitschr f Elektrotechnik*—Nov. 26, 1905. No. 73863 B.

**Appendices to the Report No. 2 on the Question of Lighting, Heating and Ventilation of Trains** (Subject IX for Discussion at the Seventh Session of the Railway Congress). Cajetan Banovits. The report appeared in this publication in April, 1905. 24 tables and figs. 235 pages. *Bul Int Ry Cong*—Jan., 1906. No. 75221 E.

**The Leitner-Lucas System of Train-Lighting.** An illustrated description of apparatus for the electric lighting of trains, which has recently been tested on the Great Western Railway, England. 2000 w. *Engng*—Feb. 16, 1906. No. 75287 A.

# RAILWAY ENGINEERING

## Train Lighting

The L'Hoest and Pieper System of Electric Train Lighting (*Die Elektrische Zugbeleuchtung von L'Hoest und Pieper*). E. Wikander. A steam dynamo on the locomotive associated with a storage battery, furnishes the current for the train. 1000 w. *Glaser's Annalen*—May 15, 1906. No. 76819 D.

The Lighting of Railway Carriages with Incandescent Gas Burners (*Gasglühlichtbeleuchtung der Eisenbahnwagen*). H. Gerdes. With illustrations of direct and inverted mantle burners as used in England, France, and Germany, with especial reference to the Pintsch incandescent light. A table of photometric tests is given. 3500 w. *Glaser's Annalen*—May 1, 1906. No. 76830 D.

The Electric Lighting of Railway Trains on the L'Hoest-Pieper System. G. L'Hoest. Describes this system in which a single generating set is employed which provides the electric energy required for the whole train, the current being distributed to the vehicles in series. Ills. 4800 w. *Bul Int Ry Cong*—June, 1906. No. 78035 E.

The Verity-Dalziel Train Lighting System. Describes this system which is in use experimentally on the Midland Railway of England. Diagrams. 3000 w. *Elect'n, Lond*—Aug. 17, 1906. No. 78,846 A.

Incandescent Gas Lighting for Passenger Cars (*Eclairage au Gaz à Incandescence des Voitures à Voyageurs*). E. Biard and G. Maucière. Data and results of experience with the ordinary and inverted mantles on the Eastern Railway of France. 7000 w. *Rev Gén d Chem de Fer*—Oct., 1906. No. 79924 G.

Tests of the Leitner-Lucas Train-Lighting Apparatus. Gives results of recent tests made of this system for the electric-lighting of trains. 1500 w. *Engng*—Oct. 19, 1906. No. 80140 A.

## Train Resistance.

The Tractive Resistance of Railway Trains (*Ueber die Zugwiderstände der Eisenbahnfahrzeuge*). P. Denninghoff. An examination of the various formulas for train resistance, with curves showing the resistances due to wind, friction, and load; with suggestions as to improved forms of cars. 5000 w. *Glaser's Annalen*—June 15, 1906. No. 78142 D.

## Trucks.

The Radial Truck. Prof. C. A. Carus-Wilson. Lecture delivered before the Tram & Lgt. Rys, Assn. An illustrated article discussing points of interest connected with the working of the radial truck, and attempts made towards its

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more perfect development. 2500 w. *Engng*—March 16, 1906. No. 75808 A.

Motor Trucks for the New York Central Electric Service. Illustrated description of the truck adopted for the electric suburban cars, which is a departure from any type of motor truck heretofore used. 1800 w. *St. Ry Jour*—April 28, 1906. No. 76412 C.

## Tyres.

Japanese Railway Tyre Works at Yawata. Plate and description of this factory for the making of tyres for railway and tramway vehicles. 2400 w. *Engng*—Oct. 19, 1906. No. 80141 A.

## Valve Gears.

History of the Walschaerts Valve Motion. M. J. Boulvin. Translated from *Revue de Mécanique*. Ills. 1500 w. *R R Gaz*—Vol. XXXIX., No. 21. No. 73435.

Walschaert Valve Gear. Max Pfander. Diagram and description, with a statement of its advantages as compared with ordinary link motion. 2000 w. *Ry & Loc Engng*—Dec., 1905. No. 73523 C.

Walschaert Valve Gear. An explanation of the mechanism, taken from advance sheets of articles prepared by the American Locomotive Co. Gives reasons for its preference. 2500 w. *Ry & Engng Rev*—Jan. 6, 1906. No. 74236.

Walschaert Valve Gear. Carl J. Mellin. From an Am. Locomotive Co. pamphlet. General description, with methods of adjusting valves and of laying out the Walschaert gear. 2500 w. *Am Engr & R R Jour*—Jan., 1906. No. 74103 C.

Early Valve-Gears on the Pennsylvania Railroad. C. H. Caruthers. Illustrated detailed description of types used as early as 1850, and before the adoption of the Stephenson link motion. 2000 w. *R R Gaz*—Aug. 17, 1906. No. 78620.

Poppet Valves on Locomotives. Describes and illustrates locomotives built in Germany, equipped with the poppet valve gear, where superheated steam is used. 3000 w. *Ry & Engng Rev*—Aug. 4, 1906. No. 78429.

Special Valve Gears for Locomotives. C. J. Mellin. Read before the Am. Ry. Mas. Mech. Assn. Describes the Gooch valve motion, the Allan, Hackworth, Joy, Walschaert and modifications, giving notes for adjusting Walschaert gear. Ills. 5000 w. *R R Gaz*—Aug. 3, 1906. No. 78419.

Water Pick-Up Apparatus for Locomotives. Charles S. Lake. Illustrates and describes different forms of water pick-up gear in use upon some of the

# RAILWAY ENGINEERING

## Valve Motion

principal English railways. 900 w. Mech. Engr—Aug. 4, 1906. Serial. 1st part. No. 78545 A.

The Walschaert Valve Gear as Applied to Locomotives. James Kennedy. An illustrated paper explaining the advantages to be derived from the use of this gear, followed by general discussion. 10000 w. Pro N Y R R Club—Sept. 21, 1906. No. 79843.

## Valve Motion.

Joy's Valve Motion. Illustrated description of a radial motion that is popular on British railways and in Japan. 1000 w. Ry & Loc Engng. Feb., 1906. No. 74855 C.

## Valves.

Distributing Valve. Illustrated description of these valves, the internal construction and operation in air brakes. 3000 w. Ry & Loc Engng—May, 1906. No. 76375 C.

Westinghouse Improved Brake Valves. Gives views of the automatic and straight air brake valves and an explanation of how they should be handled while operating the brakes. 500 w. Ry & Loc Engng—Dec., 1905. No. 73525 C.

## Wheels.

Turning Driving Wheels. Gustave Giroux. An illustrated article explaining in detail the steps taken to increase the

## NEW PROJECTS

## China

output at the Angus shops of the Canadian Pacific Ry. 2200 w. Am Engr & R R Jour—Feb., 1906. No. 74852 C.

Solid Rolled Steel Car Wheels and Tires. Peter Eyermann. Reviews the development of iron and steel wheels, the methods of manufacture, describing plants and the various types made in Europe and America. Ills. 5000 w. Ir & St Inst—May, 1906. No. 76915 N.

Cast Iron Wheels. Discusses the strength and limit of load for cast iron wheels, the flange, and the rivalry of the steel wheel. 1000 w. R R Gaz—June 8, 1906. No. 77229.

Energy Expended on Car-Wheel Acceleration. Gives a calculation based upon particular specimens of wheel and only approximately accurate for general application. 1200 w. Sci Am Sup—June 2, 1906. No. 77046.

The Chilled Car Wheel from a Manufacturer's Standpoint. P. H. Griffin. Considers the troubles due to cheap wheels, and the bargaining for low prices, which has necessarily affected the quality. 2000 w. R R Gaz—June 8, 1906. No.

Wear and Tear, or Diseases of Car Wheels. Discusses the defects of car wheels and the precautions that should be taken to prevent excessive wear or breakage. 3500 w. St Ry Jour—Aug. 25, 1906. No. 78802 C.

## NEW PROJECTS

### Alaska.

The Alaska Central Railway. M. S. Duffield. An illustrated article describing the railroad building across Kenai peninsula, and the proposed extension; the character of the country, and matters of interest in regard to its development. 3000 w. Eng & Min Jour—April 21, 1906. No. 76164.

### Canada.

Canada's New Railways. A review of recent work accomplished and proposed. Map. 2200 w. Engr., Lond.—Feb. 9, 1906. No. 75068 A.

Canadian Railroad Expansion. S. J. McLean. Concerning projected lines and the development of the railroad systems of Canada, and the interests which they serve. 4000 w. R R Gaz—July 6, 1906. No. 77814.

Canadian Railways. Information in regard to new construction work, its cost, importance, legislation, etc. 1500 w. Engr, Lond—Aug. 31, 1906. No. 79147 A.

Railroad Building in Canada. Reports remarkable activity in railroad construction and development. 1000 w. R R Gaz—Oct. 12, 1906. No. 79749.

### Central Asia.

Russian Railway Schemes in Central Asia (Eisenbahnbau und Eisenbahnpläne in Mittelasien). F. Thiess. With map of the Orenburg-Tashkend railway plans, showing the political and commercial relations of the line to Persia, Turkestan, and India. Map. 2000 w. Glaser's Annalen—May 15, 1906. No. 76818 D.

### China.

Railroad Development in China. John Foord. Discusses the importance of Japan's victory over Russia in its effect upon China, and reviews the history of railroad building, and the present attitude of China toward the construction of railroads. Map. 4000 w. Ir Age—Nov. 23, 1905. No. 73400.

What Railroads May Do for China. Eliot Blackwelder. Describes the methods of transportation used by the Chi-

# RAILWAY ENGINEERING

## Construction

## NEW PROJECTS

## Improvements

nese, which have remained unchanged for many generations. Ills. 2200 w. Wis Engr—June, 1906. No. 76698 D.

The Pekin-Hankow Railway in China. P. H. Ashmead. Map and illustrated description of the line and its equipment, with information of interest. 3000 w. Eng News—July 12, 1906. No. 77923.

Railway Systems of China. Maps showing the lines under traffic or under construction, with an account of the past experience, and present outlook for railways. 3000 w. Engr, Lond—Aug. 10, 1906. No. 78678 A.

## Construction.

Current Railway Construction. An account of the construction work in progress and proposed on English lines. 2000 w. Engng—Aug. 31, 1906. No. 79137 A.

## Cut-Off.

The Low Grade Freight Cut-Off of the Pennsylvania R. R. Illustrates and describes the construction of a low-grade double-track freight line in Southeastern Pennsylvania, which involved some of the heaviest railroad work ever undertaken in the United States. 4000 w. Eng Rec—Dec. 16, 1905. Serial. 1st part. No. 73916.

The Pennsylvania Railroad Low Grade Freight Line from Harrisburg to Atglen, Pa. Explains the purpose and character of this work, giving an illustrated description of important railway grading, with very heavy work on a small portion of the line. 3500 w. Eng News—Dec. 28, 1905. No. 74030.

The New Low-Grade Freight Line of the Erie R. R. An illustrated description of a heavy piece of railroad construction in Southeastern New York in connection with the extensive reconstruction and betterment-of-way work in progress. 2500 w. Eng Rec—Sept. 8, 1906. No. 79029.

## Cuba.

The Railroads of Cuba. An illustrated description of the railroad system, and account of the companies operating the lines. 1200 w. R R Gaz—April 20, 1906. No. 76154.

## Cyprus.

Cyprus Government Railway. Outlines the history of this island of the Mediterranean and gives a map and description of the railway under construction, with illustrations, of the interesting features. 1800 w. Engr, Lond—Nov. 17, 1905. No. 73464 A.

## Extension.

The Thief River Falls Extension of the "Soo" Line. An account of an important

piece of railroad construction during this last year, on the M., St. P. & S. St. M. Ry., through Minnesota and N. Dakota. Map and profiles. 1200 w. R R Gaz—Vol. XL, No. 4. No. 74580.

The Western Maryland Extension from Cherry Run to Cumberland. Ralph C. Davison. Illustrated description of an extension of 59.3 miles through a rough country. 5000 w. R R Gaz—Vol. XL, No. 11. No. 75545.

Lancashire and Yorkshire Railway. An illustrated detailed description of the new equipment and extensions of the Liverpool and Southport electric line. 4000 w. Tram & Ry Wld—July 12, 1906. No. 78211 B.

## Guatemala.

The Guatemala Railway. John Y. Bayliss. A brief account, with sketch map, of this road and of the difficulties that have delayed its completion; 60 miles under construction will complete the line, but much of the earlier work must be reconstructed. 2000 w. Jour W Soc of Engrs—Aug., 1906. No. 78891 D.

## Improvements.

The Chicago & Eastern Illinois 1905 Improvements. Illustrates and describes extensive improvements made necessary by the heavy coal traffic, on the Chicago division of this line. 3000 w. R R Gaz—Vol. XL, No. 11. No. 75547.

The N. Y., N. H. and H.'s New Haven Improvement. An explanation of the conditions at this point where important branches leave the main line, and the maximum limit of the cut occurs, and the changes in progress to increase the clearance. Gives an account of the legal difficulties encountered. The improvement will probably cost between four and five million dollars. Ills. 3000 w. R R Gaz—Aug. 24, 1906. No. 78831.

Details of Construction of the Ossining Improvements on the New York Central R. R. The electrification of the metropolitan zone, and the completion of the four track system, made necessary extensive construction and reconstruction works which are illustrated and described. 2200 w. Eng Rec—Sept. 22, 1906. No. 79431.

The Eastern Railway of New Mexico (Atchison, Topeka & Santa Fé Railway System). Plans and description of the construction of a new line, connecting existing lines and providing a through route to the Pacific coast and Mexico. 1800 w. Eng News—Sept. 6, 1906. No. 79092.

# RAILWAY ENGINEERING

## India

## NEW PROJECTS

## Projected Railways

### India.

Railway Construction in India. Gives views and brief notes concerning the work. 500 w. Engr, Lond—March 16, 1906. No. 76802 A.

### Japan.

Railroad Development in Japan. George E. Walsh. An account of present development and future outlook which seem to indicate a great awakening. 1500 w. R R Gaz—Vol. XXXIX., No. 23. No. 73654.

### Korea.

Opening Korea by Rail. Homer B. Hulbert. An illustrated account of the building of the Seoul-Fusan line, and the difficulties encountered. 3000 w. World's Work—Nov., 1905. No. 72921 C.

### Mexico.

The New Railroad for the West Coast of Mexico. E. A. H. Tays. Map and information concerning a railroad to be built from Guaymas, Sonora, southward, probably terminating at Tepic. 3000 w. Eng & Min Jour—April 7, 1906. No. 75997.

Making a System of Mexican Railroads. Edward M. Conley. A review of railroads under construction and projected, and the changes in their management; the new terminal harbors, and extensive improvements. Map. 3300 w. Ry Age—Sept. 21, 1906. No. 79422.

### Moffat Road.

The Denver, Northwestern and Pacific. This new road the construction of which was brought about by David H. Moffat, is generally known as the Moffat road. Describes recent work, and the country through which the road passes. Ills. 2500 w. R R Gaz—May 18, 1906. No. 76746.

### New Line.

The Opening of the Great Western's New Main Line. Charles Rous-Marten. Information concerning the opening of a line connecting London with Exeter, Plymouth, and the far west, with particulars of its rolling-stock, operation, etc. 3300 w. Engr, Lond—July 6, 1906. No. 77989 A.

The Western Pacific. An account of this new line being built from San Francisco to Salt Lake City to serve as a Pacific connection for the Gould system of railroads. Map. 1200 w. R R Gaz—Vol. XL., No. 11. No. 75546.

Construction on the Bay Shore Line of the Southern Pacific Co. Interesting construction methods are illustrated and described, especially tunnel work. 1500 w

Ry & Engng Rev—Oct. 20, 1906. No. 80011.

The Santa Fé's New Line Through the Arkansas Valley. Map and description of this new line through one of the richest irrigated districts of the United States. 1200 w. Ry Age—Sept. 28, 1906. No. 79564.

### New Road.

A Feat in Railroad Building. Lawrence Lewis. An illustrated account of the "air line" from Denver to Salt Lake City, being built by D. H. Moffat, of Denver, Colo. It has 29 tunnels in 11 miles, with wonderful engineering work. 3400 w. World's Work—Nov., 1905. No. 72922 C.

The Missouri, Oklahoma & Gulf Railway. Illustrates and describes a road under construction, discussing its traffic possibilities, ownership of real estate and the changed conditions, &c. 2400 w. Ry Age—Dec. 15, 1905. No. 73779.

### Philippines.

Philippine Railroad Projects. L. E. Bennett. An illustrated article giving information of work completed and proposed, the conditions, native labor, &c. 4000 w. R R Gaz—Vol. XL, No. 1. No. 74213.

Transportation Systems and Projects in the Philippines. Lawrence E. Bennett. Mr. Bennett's second article discusses personal experiences on reconnaissance surveys in connection with railroad construction in the Visayan islands. 3500 w. Engineering Magazine—June, 1906. No. 76872 B.

Horseback Inspection of the Philippine Railroad Projects. L. E. Bennett. An illustrated narration of some of the writer's experiences. 2500 w. R R Gaz—Vol. XL. No. 8. No. 75239.

The Plans and Organization for the Philippine Railway System. Brief account of the plans for the proposed railway system. 1000 w. Eng News—May 10, 1906. No. 76621.

New Railways in the Philippines. Percival E. Fansler. Describes present transportation facilities, and the possibilities for railway development, describing also the country through which the proposed roads are to pass. Ills. 4000 w. Cassier's Mag—June, 1906. No. 77297 B.

### Projected Railways.

Projected International Railways. A report of the projected trans-Alpine routes, with maps and information relating to them. 3800 w. Engr, Lond—March 9, 1906. Serial. 1st part. No. 75605 A.



## RAILWAY ENGINEERING

### Railway Development PERMANENT WAY AND BUILDINGS

### Coaling

#### Railroad Development.

The "Deepwater-Tidewater" Railroads. George W. Harris. Map and account of a system to extend from the head of navigation on the Kanawha River, to tide-water at Hampton Roads. 1200 w. Eng & Min Jour—Nov. 4, 1905. No. 73020.

#### Reconstruction.

The Reconstruction of the Cairo Division of the Cleveland, Cincinnati, Chicago & St. Louis R. R. Illustrated detailed description of extensive reconstruction work on this division in Illinois. 5500 w. Eng Rec—Aug. 11, 1906. No. 78499.

#### Rhodesia.

The Rhodesia Railways in South Africa. Frank C. Perkins. An illustrated article describing these railways and their rolling stock. 1600 w. Sci Am Sup—Jan. 20, 1906. No. 74442.

#### Siberian.

Circum-Baikal Railway. Brief account of the great floating ferry first constructed for crossing this large lake, and the more recent construction of a line around the southern extremity of the lake. 1400 w. Engng—Aug. 31, 1906. No. 79143 A.

#### Switzerland.

New Railway Projects in Switzerland (Neue Schweizerische Eisenbahnprojekte). Dr. R. Moser. A discussion of proposed communications over the Eastern Alps, comparing the tunnel routes by way of the Greina Pass and the Splügen Pass. Two articles. 4500 w. Schweiz Bauzeitung—Feb. 3, 10, 1906. No. 75126 each B.

#### Tehuantepec.

The Tehuantepec Railway and the Harbors at Its Ocean Terminals. An illustrated detailed description, with information of interest. 2000 w. Eng News—July 5, 1906. No. 77816.

#### Trans-Andine.

The Trans-Andine Railroad. Major J. Orton Kerbey. Some interesting information concerning the various railroad projects and the difficulties in the way of their realization. 2000 w. R R Gaz—Aug. 3, 1906. No. 78420.

#### Transcontinental.

Developments in the Trans-Continental Railway System. A map showing ten important additions to the trans-continental railway system, giving particulars of these new lines. 2500 w. Eng News—Oct. 4, 1906. No. 79620.

## PERMANENT WAY AND BUILDINGS

#### Amsterdam.

Plan for the Improvement of the Railway Connections at Amsterdam (Ontwerp-Verbetering der Spoorwegverbindingen om Amsterdam). N. W. Nierstrasz. A long report to the Institute of Engineers with plans for a new terminal, a ring railway, and extended facilities. 10000 w. 2 plates. De Ingenieur—April 14, 1906. No. 78181 D.

#### Ash Handling.

Ash Handling Plants at Railway Ash Pits. Illustrates and describes the plant at McKees Rocks, Pa., near Pittsburg; and the Robertson ash-handling system at West Milwaukee, Wis. 1200 w. Eng News—March 22, 1906. No. 75650.

#### Ballast.

Ballasting. Abstract of report presented at meeting of the Am. Ry. Engng. & Main. of Way Assn., with discussion. 7300 w. Ry Age—March 23, 1906. No. 75819.

#### Bridges.

See Civil Engineering, Bridges.

#### Car House.

The Federal Street Car House of the Rochester Railway Company. I. E. Mat-

thews. Gives plans and description of a building large enough to hold about 100 double-truck cars. 1600 w. St Ry Jour—Dec. 2, 1905. No. 73521 C.

#### China.

Railway Construction in North China. Edward Hulme Rigby and William Orr Leitch, Jr. A description of the Chinchou-Yingkow section, 97 miles in length. Ills. 18000 w. (No. 3509.) Inst of Civ Engrs. No. 73156 N.

#### Coaling.

Mechanical Coaling Plants for Locomotives (Mechanische Lokomotiebekohlungsanlagen). E. Harprecht. An illustrated discussion of modern conveyors, coaling bins, and coal handling appliances for railroads, with details from American and German practice. Serial. Part I. 3000 w. 2 plates. Glasers Annalen—May 15, 1906. No. 76817 D.

Mechanical Coaling Stations for Locomotives (Installations de Chargement Mécanique du Charbon dans les Dépôts de Locomotives). Illustrating and describing Belgian, German, and American railroad coaling stations, with details of bins, conveyors, etc. 2000 w. 1 plate. Génie Civil—Aug. 11, 1906. No. 79313 D.

# RAILWAY ENGINEERING

## Coaling Plant

### Coaling Plant.

The Watscka Coal, Ash and Water Plant of the Chicago & Eastern Illinois R.R. A recently built plant, having a number of advantageous features is illustrated and described. 1500 w. Eng Rec—April 14, 1906. No. 76318.

### Coaling Station.

A Reinforced Concrete Locomotive Coaling Station of Unusual Construction on the Lehigh Valley Railroad. W. E. Phelps. A new concrete-steel station at South Easton, Pa., is illustrated and described. 1000 w. Eng News—June 14, 1906. No. 77441.

### Cologne.

The Transformation of the Railway Facilities about Cologne (Ueber die Umgestaltung der Bahnanlagen bei Köln). H. Kumbier. Describing the importance of Cologne as a railway centre, with especial reference to the new passenger stations. 3500 w. Glasers Annalen—Nov. 15, 1905. No. 73818 D.

### Construction.

The South & Western Railway. Illustrated description of interesting construction work on this new line which will furnish a direct, low-grade line from the coal fields of Virginia and Kentucky to Southern tide-water ports. It includes 33 tunnels, and the cost of the line will average \$125,000 per mile. 1800 w. Ry Age—Oct. 19, 1906. Serial. 1st part. No. 80021.

### Construction Work.

Construction Work on the Canadian Northwestern Railway System. An illustrated description of the building of this railway, especially the construction work during the past season. 3000 w. Eng News—April 5, 1906. No. 75946.

### Constructor.

Notes on American Permanent Way Construction (Einige Bemerkungen über den Oberbau Amerikanischer Bahnen). E. Giese. A general description of the track construction of American railways, including road bed, rails, sleepers, and joints. 3500 w. Zeitschr d Ver Deutscher Ing—Jan. 20, 1906. No. 75100 D.

Railroad Construction Classification—Construction Expenses and Construction Record. Charles Hansel. Gives a subdivision of the classification of construction expenses as set forth by the Interstate Commerce Commission, providing a close analysis which may be extended. 3500 w. Ry Age—Feb. 23, 1906. No. 75252.

### Crossings.

A Graphical Method of Determining the Relative Positions of Points and

## PERMANENT WAY AND BUILDINGS

## Electric Driving

Crossings. Charles John Albrecht. Brief description of method. 600 w. (No. 3489.) Inst of Civ Engrs. No. 73167 N.

### Culverts.

Notes on the Design and Construction of Reinforced Concrete Culverts. C. F. Graff. Discusses the advantages and economy of this type of culvert and submits designs of reinforced concrete, discussing them in detail. Ills. 3300 w. Eng News—Jan. 4, 1906. No. 74170.

Areas of Waterways for Railroad Culverts and Bridges. George H. Bremner. Also discussion by James Dun, J. W. Alvord, Louis Kingman and others. Explains the method used by the writer after a number of years of experience. 21500 w. Jour W Soc of Engrs—April, 1906. No. 76929 D.

The Reinforced Concrete Beam Culvert: An Inefficient Structure. Daniel B. Lutin. Arguments unfavorable to the use of beams. Ills. 2000 w. Eng News—May 24, 1906. No. 76778.

A Low-Cost Concrete Culvert. W. H. Whorley. Read before the Engng. Assn. of the South. Describes a 12-ft. full-centered concrete arch culvert with 6-ft. side walls constructed on the Nashville, Chattanooga and St. Louis Ry. Gives tables of cost of concrete structures. 1200 w. Eng News—July 5, 1906. No. 77818.

### Curves.

The Determination of Curve Deflections and Rail Joints (Beitrag zur Lehre von der Berechnung der Bogenweichen und Geleisverbindungen). A mathematical discussion of the laying out of railway curves and junctions. 5000 w. Zeitschr d Oesterr Ing u Arch Ver—Dec. 1, 1905. No. 73824 D.

Line and Surface. Moses Burpee. This first of a series of articles, explains the principles governing the properties of curves. 1800 w. Ry & Engng Rev—April 21, 1906. Serial. 1st Part. No. 76171.

Curve Resistance. William G. Raymond. Explains the action of a truck on a curve, discussing the theory of curve resistance. 2500 w. R R Gaz—Aug. 17, 1906. No. 78619.

### Dust.

The Prevention of Dust on Roads and Railway Tracks by Sprinkling with "Westrumite." Describes this petroleum product, which has been used in Europe and is being introduced in America, giving its advantages, disadvantages and cost. 1600 w. Eng News, Feb. 22, 1906. No. 75246.

### Electric Driving.

Electric Power in the P. R. R. Shops at Altoona, Pa. Wait Reynolds Love-

# RAILWAY ENGINEERING

## Ferry Terminal

less. An illustrated article describing the extensive use made of electric power in this large plant. 2800 w. Elec Wld—Aug. 18, 1906. No. 78655.

## Ferry Terminal.

The Manhattan Island Ferry Terminal for the West Shore. Plan and description of a new terminal to be built by the New York Central R. R., at West 42d Street, in New York City. 1500 w. Ry Age—Oct. 5, 1906. No. 79645.

## Freight Station.

New Freight Station at Cincinnati, O.; Cincinnati Southern Ry. Illustrated description, with statement of the requirements as given in the specifications. 1000 w. Eng News—Dec. 7, 1905. No. 73623.

## Freight-Yards.

The Design of Yards for Classifying Freight Cars. W. A. MacCart. Considers some of the plans and methods of yard operation now in use and the efforts being made to develop some method to minimize the delay to freight traffic. 6500 w. Eng News—March 15, 1906. No. 75523.

## Frogs.

Frogs Without Guard Rails. Illustrates and describes the Conley frog, which has as its especial feature the outer raised guard rails, bolted to the frog rails. Also the Graham frog, which has flange blocks or guards of Menard hardened steel bolted to the frog rails. 1000 w. Eng News—March 15, 1906. No. 75524.

## Gauges.

The Gauge of Colonial Railways. Information concerning the gauges used in Australia, India and South Africa. 2700 w. Engr, Lond—April 13, 1906. No. 76309 A.

## Grades.

Grade Separation at Cleveland, Ohio. George H. Tinker. An illustrated description of work in progress and completed. 1500 w. R R Gaz—Vol. XL., No. 12. No. 75643.

Ruling Grades on the Transcontinental Lines. Profiles and tables of the Harriman lines and Northern Pacific, with revised table of ruling grades on A., T. & St. F., and the Can. Pacific. 600 w. R R Gaz—May 4, 1906. No. 76495.

## Gravel Washing.

The Lake Shore Gravel Ballast Washing Plants. Illustrates and describes plants in Indiana which are working satisfactorily and handling large quantities of material. 2000 w. R R Gaz—Sept. 14, 1906. No. 79190.

## Improvements.

Wabash Improvements East. Map

## PERMANENT WAY AND BUILDINGS

## Light Railway

and illustrated description of recent and current development and betterment of the Pittsburgh Terminal and the Wheeling & Lake Erie lines. 3000 w. Ry Age—March 23, 1906. No. 75812.

New York Central Roadbed Improvements in the Vicinity of New York City. Illustrates and describes improvements made north of Mott Haven, including additional tracks, tunnels, new roadbed, cut-offs, depression, &c. 1600 w. Ry & Engng Rev—Dec. 16, 1905. No. 73784.

Some Money Saving Schemes, Minneapolis & St. Louis R. R. Brief descriptions of devices for saving labor in shops and tending to economy. A tool for truing wrist pins; a tool for threading radical stays, having button heads; a device for facing off the joints on cinder hoppers; and other tools and methods are described. Ills. 1500 w. Ry Mas Mech—Dec., 1905. No. 73500.

## India.

The Railway-Gauges of India. Sir Frederick Robert Upcott. A review of present conditions, as introductory to a discussion of the best course to take for the future development of traffic. Discussion, drawings and map. 60000 w. Inst of Civ Engrs—No. 3586. No. 79513 N.

## Interlocking.

Power Interlocking Plants in Great Britain and on the Continent. Considers the methods of operating railway switches and signals by power. 2000 w. Ry Age—June 29, 1906. No. 77734.

Baltimore & Ohio Interlocking Plant at Watersville Junction. Plan and description of a mechanical interlocking signal plant recently installed in Maryland. 1000 w. Ry Age—Sept. 28, 1906. No. 79566.

## Key West Extension.

Key West Extension of the Florida East Coast. Harry C. Smith. An illustrated article describing the progress and explaining some of the difficulties. 1800 w. R R Gaz—April 20, 1906. No. 76152.

## Leipzig.

The New Railway Station at Leipzig (Der Neue Hauptbahnhof in Leipzig). H. Heinrich. A detailed description of the new union railway station in Leipzig, with plans of the railroad connections. Serial. Part I. 5000 w. Two plates. Glasers Annalen—Jan. 15, 1906. No. 74635 D.

## Light Railway.

Light Railway on Ayrshire Seaboard. Illustrates and describes the Maidens and Dunure Light Railway, which overcame

# RAILWAY ENGINEERING

## Line Stakes

considerable engineering difficulties in its construction. It has 65 bridges, 20 viaducts, 6 culverts, and the entire length of the railway is only 19½ miles. 900 w. Engr, Lond—May 18, 1906. No. 77021 A.

## Line Stakes.

Setting Line Stakes on Existing Railroad Curves by Middle Ordinates. G. W. Snyder. Gives an explanation of this method. 800 w. R R Gaz—Oct. 19, 1906. No. 79867.

## Location.

Some Tables and Other Data for Railway Locating Engineers. C. P. Howard. Gives tables in form so that calculations of cost can be made in the shortest possible time and with reasonable accuracy, with explanatory notes. 3500 w. Eng News—Sept. 13, 1906. No. 79167.

## Mountain Roads.

The Design of Rack Railways (Les Chemins de Fer à Crémaillère). A. Levy-Lambert. A very complete review of the various types of rack railways and locomotives, as used on steep grades in mountainous districts in Europe and America. 15000 w. Mem Soc Ing Civ de France—March, 1906. No. 78139 G.

## New South Wales.

Early Railway Construction in New South Wales. Joseph Brady. Brief account of work from 1850 to 1857. 1800 w. (No. 3467.) Inst of Civ Engrs. No. 73158 N.

## Panama.

Increased Terminal Facilities for the Panama Railway. A brief account of the steps being taken to provide ample rail and water facilities for the handling of both through and canal traffic. 500 w. Eng News—May 24, 1906. No. 76780.

## Pennsylvania R. R.

The Pennsylvania R. R. Extension to New York and Long Island: Structural Details of Long Island Power Station. Illustrates and describes in detail the novel and the more important structural features of the power house in Long Island City. 1700 w. Eng News—May 31, 1906. No. 77036.

## Piece Work.

A Rational Method for the Introduction and Management of Piece-Work in Railroad Shops. William S. Cozad. From a paper before the New England R. R. Club. An explanation of methods adopted in the Erie R. R. shops. 3000 w. Am Engr & R R Jour—Aug., 1906. No. 78411 C.

## Power Plant.

Power Plant in the Silvis Shops of the Rock Island System. O. Monnett. Illustrated detailed description of a power

## PERMANENT WAY AND BUILDINGS

## Railroad Offices

house distributing electric power, compressed air, hydraulic power, live steam, exhaust steam, service water, hot water and drinking water. 3000 w. Engr, U S A—July 2, 1906. No. 77746 C.

## Rail Fastenings.

A Discussion of Screw Bolts for Rail Chairs (Considérations Générales sur la Facilité de Descente des Tirefonds). E. Perrond. An experimental investigation into the force required to screw the bolts into wooden cross ties without injuring the wood. The Collet torsionmeter is described. 4000 w. 1 plate. Rev Gen d chem de Fer—Aug., 1906. No. 79923 G.

Screw Connections for Metal Cross Ties for Railways (Le Deserrage des Vis dans les Assemblages Métalliques des Voies de Chemins de Fer). L. Schüssel. With illustrations of a variety of metal cross ties used in France, showing methods of securing the rails. 2500 w. Génie Civil—Sept. 22, 1906. No. 79910 D.

## Rail Heads.

Removable Rail Heads. William H. Booth. Illustrated description of the system of the Romopac Tramway Construction Co., Ltd., Leeds, England. 800 w. Cassier's Mag—Oct., 1906. No. 79527 B.

## Rail Joints.

Improved Rail Joint for Street Railways (Neue Schienenstossverbindungen für Strassenbahnen). W. Küppers. Describing a form of joint in which an intermediate headpiece of rail is inserted. A portable milling machine is used to finish off the surface of the joint. 2500 w. Zeitschr d Oesterr Ing u Arch Ver—April 6, 1906. No. 76226 D.

Wheel Carrying Rail Joints and Tie Preservation. Max Barschall. Gives information concerning these joints and illustrations and description of the new method for applying wheel-carrying joints. Also remarks on the improved process of treating ties. 1500 w. Bul Int Ry Cong—Sept., 1906. No. 79890 E.

See Street and Electric Railways.

## Railroad Engineering.

The Division Engineer. Discusses experiences occurring in railroad work, dealing in the present number with maintenance work. 1200 w. R R Gaz. Vol XL. No. 6. Serial. 1st part. No. 74948.

## Railroad Offices.

General Features and Foundation Details, New Office Building, New York Central Lines. An illustrated description of an important and interesting building to be built in connection with the improvements at the New York terminal.

# RAILWAY ENGINEERING

## Rails

2500 w. Eng Rec—Feb. 24, 1906. No. 75-262.

## Rails.

Specifications for Steel Rails. Gives the specifications and recommendations adopted by the Am. Ry. Engng. and Main. of Way Assn., the Am. Soc for Test. Materials, and the Am. Soc. of Civ. Engrs. 2500 w. R R Gaz—Vol. XL., No. 11. No. 75551.

The First T Rail? Engraving and account reproduced from the Morton Memorial Volume, edited by Prof. F. de R. Furman, of Stevens Inst., Hoboken, N. J. 700 w. R R Gaz—May 11, 1906. No. 76613.

Rail Corrugation. G. Moyle. A technical paper issued by the Indian Government, reporting investigation into the cause of what is termed "roaring rails." Ills. 2000 w. Tram & Ry Wld—No. 77402 B.

Rail Corrugation. F. T. Aman. A report of an investigation of such rails by means of the microscope and camera. Ills. 1000 w. Tram & Ry Wld—July 12, 1906. No. 78213 B.

Comparison of American and Foreign Rail Specifications, with a Proposed Standard Specification to Cover American Rails Rolled for Export. Albert Ladd Colby. Read before the joint meeting of the A. I. M. E. and the Ir. & St. Inst. The object of the paper is to clear up some matters in regard to rails for export. 1500 w. Ir & Coal Trds Rev—July 27, 1906. No. 78482 A.

Note on the Metal Screw Bushes for Strengthening Rail Fastenings, on the Thiollier System. Describes the method of putting in the bushes; the cost, results, resistance, etc., are discussed, and the applications considered. 3000 w. 6 tables & fig. Bul Int Ry Cong—Aug., 1906. No. 79280 E.

Historical Sketch of the First Cast and Malleable Iron Railway Rails. George P. Raidabaugh. Historical review with outline drawings. 1500 w. Sib Jour of Engng—Oct., 1906. No. 80002 C.

## Railway Work.

Railway Grading, Ditching, and Bank Building Machines. Illustrates and describes some machines of great importance in railway construction. 1200 w. Eng News—Jan. 4, 1906. No. 74173.

## Reconstruction.

Big Four Reconstruction, Indianapolis to Coal Bluff. Illustrates and describes some of the heaviest work undertaken in carrying forward betterments of this road. 59 miles of double track replace existing

## PERMANENT WAY AND BUILDINGS

## Shops

single track, and 20 miles of cut-off. 2000 w. Ry Age—July 6, 1906. No. 77853.

Rebuilding the Highland Division of the New York, New Haven & Hartford. An explanation of the new lines recently acquired by the N. Y., N. H. & H. R. R. and the work undertaken to prepare the lines for modern traffic, especially the double-tracking of the line from Hopewell, N. Y., to Danbury, Conn. Ills. 2500 w. R R Gaz—July 13, 1906. No. 77947.

## Reinforced Concrete.

The Use of Armoured Concrete in Railway Work in Russia. Serge de Kareischa. The first part contains particulars of the investigations made in Russia on the question of armoured concrete; and the second part describes in greater detail the methods adopted in the case of various constructive works. 13000 w. 17 tables. Ills. Bull Int Ry Cong—Feb., 1906. No. 75415 E.

## Retaining Wall.

Concrete Retaining Wall of the Illinois Central on the Lake Front, Chicago. Illustrations and description of the east wall now under construction, with outline of work previously completed. 1000 w. R R Gaz—Vol. XXXIX., No. 20. No. 73225.

## Roadbed.

A Concrete Roadbed for Railroads. Illustrated description of a design for a concrete roadbed using longitudinal timber supports for the rails, giving estimate of cost. 1100 w. Ry Age—Sept. 1, 1906. No. 79423.

## Rock Island.

Rock Island Company. An outline of the various lines composing this system with information from recent reports concerning the operation, earnings, &c. 2800 w. R R Gaz—Vol. XXXIX., No. 22. No. 73541.

## Round Houses.

Improved Round House Facilities. J. C. Stuart. Remarks on the problems due to increase in size and weight of locomotives, with illustrated detailed description of the extensive improvements introduced on the Erie Railroad. 1600 w. R R Gaz—June 15, 1906. No. 77279.

## Shop Efficiency.

Improving Railroad Shop Efficiency. Charles Coleman. Considers reduction in the cost of repairs without impairing the efficiency of the locomotive. 1000 w. Am Engr & R R Jour—May, 1906. No. 76467 C.

## Shops.

A Visit to the P., B. & W. Ry. Wilmington Shops. An illustrated article

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## Shops

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## Shops

dealing with the most striking features noticed on a recent visit to these shops. 3500 w. Ry & Engng Rev—June 16, 1906. No. 77355.

Locomotive Shop Management. A. W. Wheatley. Offers a suggestion for a uniform classification of repairs, and also for other improvements in shop organization. 1600 w. Am Engr & R R Jour—June, 1906. No. 77118 C.

New Kingsland, N. J., Shops of the D., L. & W. Ry. Illustrated detailed description of recently modernized repair shops and their equipment. 2500 w. Ry & Engng Rev—June 9, 1906. No. 77212.

South Louisville Shops. This first of a series of articles illustrates and describes their general plan and operation. 1500 w. Am Engr & R R Jour—June, 1906. Serial. 1st part. No. 77115 C.

The New Shops of the Canada Car Company, Ltd., at Montreal. A recently completed plant, considered one of the best of the kind on the Continent, is illustrated and described. 3000 w. R R Gaz—June 8, 1906. No. 77224.

East Moline Locomotive Shops. Begins an illustrated detailed description of these five repair shops of the Rock Island system. 3000 w. Am Engr & R R Jour—Nov., 1905. Serial. 1st part. No. 72943 C.

Electric Drive in Locomotive Repair Shops. A. S. Atkinson. Describes the electric drive in the large car shops of the Buffalo, Rochester & Pittsburgh Ry. Co. at Du Bois, Pa., giving details of operation and results obtained. 2500 w. Ry & Loc Engng—Nov., 1905. No. 72929 C.

Locomotive Works, and Shop Practice in Italy. The present number is principally a description of the "Elvetica" works of The Ernesto Breda Company, of Milan, and the methods used there. Ills. 4400 w. Engr, Lond—Dec. 15, 1905. Serial. 1st part. No. 74055 A.

The Kingsland Shops of the Lackawanna R. R. These coach and locomotive shops in New Jersey are illustrated and described. They will cover an area of 8.5 acres, and will cost \$1,000,000 when completed and equipped. 3500 w. Eng Rec—Dec. 2, 1905. No. 73574.

Winnipeg Shops of the Canadian Pacific. Illustrates and describes large modern shops for repair work. 1000 w. R R Gaz—Vol. XXXIX., No. 26. No. 74084.

Sedalia Shops, Missouri Pacific Ry. Illustrated detailed description of the shops and their equipment. The group system

of motor driving utilized. 6800 w. Ry & Engng Rev—Jan. 6, 1906. No. 74235.

The Conduct of American Repair Shops (Aus dem Betriebe Amerikanischer Reparaturwerkstätten). G. Dinglinger. Describing especially the methods of railroad shops in the United States, with forms of time cards, job and material tickets, inspection forms, and general works management system. 6000 w. Glasers Annalen—Dec. 15, 1905. No. 74614 D.

The New Shops of the Canadian Pacific Railway at Winnipeg. Wheeler Carr. Illustrated description of shops for repair work which present features of interest. 2800 w. Engr, U S A—Jan. 1, 1906. No. 74321 D.

New Locomotive and Car Shops of the Louisville and Nashville Ry. Illustrated description of the new shops at South Louisville, Ky. 2000 w. Eng. News—Feb. 8, 1906. No. 74914.

In the Railroad Shops. A. S. Atkinson. Calls attention to improvements recently observed in methods of arrangement, lighting, setting of machines, &c. 2300 w. Am Engr & R R Jour—March, 1906. No. 75314 C.

Ivorydole Shops, Cincinnati, Hamilton & Dayton Ry. Illustrated detailed description of terminal plant and repair shops. 3300 w. Ry & Engng Rev—March 3, 1906. No. 75347.

Some Small Successful Shop Savings. C. J. Crowley. A short paper on this subject, introducing a lengthy general discussion. 11000 w. Pro W Ry Club—Feb. 20, 1906. No. 75619 C.

The Electrical Equipment of the South Louisville Shops of the Louisville & Nashville. Illustrates and describes interesting applications of the electric drive. 1000 w. R R Gaz—Vol. XL., No. 10. No. 75442.

The Missouri Pacific Shops at Sedalia, Mo. Illustrated detailed description of new shops. 4500 w. Ry Mas Mech—March, 1906. No. 75346.

New Shops of the Missouri, Kansas & Texas Railway, Parsons, Kansas. Illustrates and describes the new plant under construction for repair facilities. 900 w. Ry Age—April 13, 1906. No. 76068.

Big Four Shops at Indianapolis. Plans and brief description of new shops to be built near Indianapolis. 2000 w. Ry Age—Aug. 3, 1906. No. 78507.

Organization and Economy in the Railway Machine Shop. H. W. Jacobs. The first of the series discusses the importance of specializing and centralizing the operation and equipment. 3500 w.

# RAILWAY ENGINEERING

## Shops

Engineering Magazine—September, 1906. No. 78776 B.

Trenton Shops of the Pennsylvania Railroad. Illustrated detailed description of shops designed to care for the repairs of 500 locomotives in service, the present capacity being 35 locomotives per month. 5000 w. Ry Age—Aug. 10, 1906. No. 78510.

Angus Shops—Canadian Pacific Railway. First of a series of illustrated articles on the operation of the Angus shops. 4500 w. Ry Mas Mech—Sept., 1906. Serial. 1st part. No. 79024.

Organization and Construction Methods Used on the Ivorydale Shops of the C. H. & D. Plan, with detailed description of the methods employed. 2500 w. R R Gaz—Sept. 21, 1906. No. 79404.

Organization and Economy in the Railway Machine Shop. H. W. Jacobs. The second article of the series treats of the standardization of parts and tools, with illustrations of tools and their operation. 4000 w. Engineering Magazine—Oct., 1906. No. 79383 B.

Organization and Economy in the Railway Machine Shop. H. W. Jacobs. The third paper discusses the broad problems of centralizing and balancing the tool equipment for an entire railway with a view of obtaining the maximum efficiency of the plant. 4000 w. Engineering Magazine—Nov., 1906. No. 79993 B.

## Signals.

Signaling and Interlocking. Abstract of a report presented at meeting of the Amer. Ry. Engng. & Main. of Way Assn., with discussion. 9500 w. Ry Age—March 23, 1906. No. 75822.

Block Switch and Signal Systems (Blockapparate und Weichenverschlüsse). Dr. A. Tobler. Describing especially the electric block system of Siemens & Halske, as used in Vienna. Two articles. 4000 w. Schweiz Bauzeitung—April 21, 28, 1906. No. 76831 each B.

The Upward Indication of the Semaphore Arm. L. R. Clausen. Read before the Ry. Sig. Assn. Favoring the change from the downward to the upward indication for proceed, giving arguments. Ills. 2000 w. Ry Age—May 4, 1906. No. 76536.

Union All-Electric Interlocking at Elsmere Junction. Illustrates and describes an interlocking plant installed near Wilmington, Del. 2500 w. R R Gaz—May 11, 1906. No. 76515.

Electro-Pneumatic Block Signals on the Electrified Line of the West Jersey and Seashore. An illustrated description

## PERMANENT WAY AND BUILDINGS

## Signaling

of the signal installation on this line between Camden, N. J., and Atlantic City. 2000 w. R R Gaz—Oct. 5, 1906. No. 79642.

Operation of Railway Points and Signals by Power. Illustrates and describes the low-pressure pneumatic system installed at Basingstoke, on the London and South Western railway. 3300 w. Engng—Sept. 28, 1906. No. 79704 A.

## Signaling.

Combined Manual and Automatic Block Signaling on the C., N. O. & T. P. An explanation of the operations of the system near Danville, Ky., where a single track is signaled by the controlled manual system for opposing trains and by track circuit signals for following trains. 1000 w. R R Gaz—July 27, 1906. No. 78265.

Electric Signaling on English Railroads. A report of the progress of the electrification of signals in England, and the cause of the delay. Ills. 1600 w. Elec Engr, Lond—June 29, 1906. Serial. 1st part. No. 77885 A.

The Use of Electric Currents with Isolated Rails for the Control of Trains (Over Stroomketens met Geïsoleerde Rails ter Beveiliging van den Loop der Treinen). J. D. C. M. de Roos. A study of electric signalling for single and double track railways. 12000 w. Tijdschr van het Klijk Inst van Ingenieurs—Feb. 3, 1906. No. 78187 H.

The Forestier System of Templates for Automatic Signalling (Preparateur d'Itinéraire Système J. Forestier). R. Coupan. The successive connections for any given train are controlled by electric contacts placed in proper sequence on a template disc, avoiding accidents or delays. 3000 w. 1 plate. Génie Civil—Aug. 18, 1906. No. 79315 D.

An English Electric System of Railway Signaling. F. C. Perkins. An illustrated description of the Webb & Thompson electric point and signal apparatus installed on the London & Northwestern Railway. Shows the devices used in one of the signal cabins at Crewe, which will contain more than 1,000 levers. 1800 w. Sci Am Sup—Nov. 11, 1905. No. 73093.

A Cheap Method of Interlocking Switches and Signals. P. Grade. Describes a system of interlocking without placing the levers together in one cabin, or having to carry keys about. Gives applications, trials, and statement of advantages and cost. 3400 w. Ills. Bul Int Ry Cong—Nov., 1905. No. 73753 E.

The Upward Indication of the Semaphore Arm. L. R. Clausen. Reviews the history of this method of signaling, and

# RAILWAY ENGINEERING

## Signaling

## PERMANENT WAY AND BUILDINGS

## Stations

discusses the question of changing from the downward to the upward indication for proceed, giving arguments in favor of the change. Ills. 2000 w. *Wis Engr*—Dec., 1905. No. 73751 D.  
Mackenzie & Holland's Improved Sykes Block Signal, East Bengal State Railways. G. K. Rogers. Read before the Ry Signal Assn. Diagram and description of this system and its workings. 700 w. *Ry & Engng Rev*—Jan. 20, 1906. No. 74485.

Signal Arrangements for the New York Central Electrified Zone. Extracts from a paper by W. H. Elliott in *Railway Men* for Jan. Explains some details of the signaling plans. 2700 w. *R R Gaz*—Vol. XL, No. 2. No. 74330.

All-Electric Interlocking at Council Bluffs. Illustrates and describes a plant under construction on the Union Pacific. 2500 w. *R R Gaz*—June 8, 1906. No. 77221.

Block and Interlocking Signals in the Electrical Zone of the New York Central & Hudson River R. R. Illustrated detailed description of the extensive all-electric system. 3000 w. *Eng News*—June 14, 1906. No. 77434.

Block Signal System of the New York Central Electric Zone. The details of this interesting system are illustrated and described. It is known as the "Young System," and seems an important advance in the art of signaling. 3000 w. *St Ry Jour*—June 9, 1906. No. 77201 C.

The Brierley Fog-Signaling Apparatus for Railroads. Illustrates and describes an apparatus being tried on the Great Northern Railway of Great Britain. 1500 w. *Sci Am*—June 2, 1906. No. 77050.

Progress in the Use of the Block System. Gives a table of statistics of railroad lines in the United States on which the block system is in use, with explanations. 2200 w. *R R Gaz*—Vol. XL. No. 5. No. 74820.

Automatic Signals in Great Britain and on the Continent. Interesting information concerning the causes that have worked against the introduction of automatic systems. 2500 w. *Ry Age*—April 20, 1906. No. 76169.

Blake Signals: Their Operation and Uses. E. J. Burke. Abstract of a paper read before the Cent. Elec. Ry. Assn. Explains the uses in detail, and gives general information in regard to the system. 2000 w. *St Ry Rev*—April 15, 1906.

## Sleepers.

Automatic Sleeper Adzing and Boring Machine. Illustrates and describes a machine for dealing with large and heavy

sleepers of any kind of wood, and is used for simultaneously adzing both ends and cross-cutting the sleeper to length, and boring four spike holes at each end. 600 w. *Engng*—Aug. 31, 1906. No. 79140 A.

Plant of the Ayer & Lord Tie Co., at Carbondale, Ill. R. E. Bright. Illustrated description of machinery and methods used for preserving wood railway ties. 1300 w. *Engr, U S A.* Sept. 15, 1906. No. 79292 C.

## Stations.

New Passenger Station for the B. & O. R. R. at Wheeling, W. Va. An illustrated description of a fireproof structure having three stories and attic, but no basement, as the location is such that it would be flooded during high water. 1000 w. *Ry & Engng Rev*—July 7, 1906. No. 77855.

The Enlargement of Victoria Station. Begins an illustrated detailed description of this reconstructed and greatly enlarged station on the London, Brighton, and South Coast Railway. 5000 w. *Engng*—July 13, 1906. Serial. 1st part. No. 78215 A.

The Pennsylvania Station in New York. Illustration, and plans at different levels, and cross-section profiles, with descriptive notes. 1000 w. *R R Gaz*—Vol. XL. No. 6. No. 74947.

The El Paso Union Passenger Station. Illustrated detailed description of this Texan station recently opened for traffic. 1200 w. *Ry Age*—Oct. 5, 1906. No. 79643.

Progress of the Washington Union Station. An illustrated article showing the rapid progress being made on the building and approaches. 2000 w. *R R Gaz*—Aug. 3, 1906. No. 78418.

New York Central Passenger Station at Schenectady. Outlines improvements in this city to eliminate grade crossings and describes the fine new station building. Plans. 1800 w. *Ry Age*—April 27, 1906. No. 76402.

Pennsylvania Railroad's Terminal Station, New York City. Illustrated description of the proposed design. 1600 w. *Sci Am*—May 26, 1906. No. 76788.

The Pennsylvania Railroad's Extension to New York and Long Island. Plan, section, and illustrations of the new station in New York, with description. 2000 w. *R R Gaz*—May 25, 1906. No. 76966.

The Pennsylvania Railroad Passenger Station in New York City. Description, with illustrations, of the fine station to be built in New York City. 1500 w. *Eng News*—May 24, 1906. No. 76776.



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## Steep Grades

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## Terminals

Santa Fe Standard Concrete Depots. Illustrates and describes some of these buildings, 21 of which are under contract. 1000 w. Ry Age—March 23, 1906. No. 75816.

The Washington Terminal Station. Theodore Starrett. An illustrated description of the concrete foundation work which has recently been completed on the new railroad building now in course of construction. 800 w. Cement Age—March, 1906. No. 75465.

## Steep Grades.

The Lake Champlain & Moriah Railroad. J. H. Granbery. Map and description of this line with illustrated account of an unusual accident causing the wreck of a locomotive and seven ore cars. 1400 w. Eng & Min Jour—June 30, 1906. No. 77742.

## Subways.

Reinforced-Concrete Subways on the Chicago, Burlington & Quincy Ry. Describes subways being constructed at Galesburg, Ill., in connection with a large classification yard. Ills. 2200 w. Eng Rec—March 10, 1906. No. 75478.

## Surveying.

See Civil Engineering, Measurement.

## Switchbacks.

Switchbacks on the Crown King Extension of the Santa Fé, Prescott & Phoenix Ry. Map, profile and plans, with description. 700 w. Eng News—June 21, 1906. No. 77413.

## Switches.

Devices to Keep Railroad Switches from Becoming Clogged with Snow and Ice. Francis G. Shaw. Read before the Ry. Sig. Assn. Gives the claims made for these devices, and describes two systems; one a gas-burning device, the other a hot oil circulation. 700 w. Eng News—Oct. 18, 1906. No. 79833.

Frogs and Switches. Robert E. Einstein. Reviews the development and discusses the details, especially the improvements of recent years, and the defects. 5000 w. Jour Assn of Engng Soc—May, 1906. No. 78588 C.

A New French Pneumatic Interlocking Machine. Illustrated detailed description of a new design of machine being installed at numerous stations in France for interlocking switches and signals. 6000 w. Ry & Engng Rev—March 17, 1906. No. 75587.

Interlocking on the Lackawanna at Roseville. Illustrated description of a recently completed plant of 49 levers, at Newark, N. J., having special details of

interest. 1200 w. R R Gaz—Vol. XL., No. 13. No. 75837.

Substituting Track Circuits for Detector Bars. W. N. Spangler. Read before the Ry. Sig. Assn. Calls attention to the features to be guarded against in electric lock signals, and the need of testing and inspection each day; urges the advantages of the track circuit over the detector bars. 2300 w. Ry & Engng Rev—March 24, 1906. No. 75677.

The Arrangement of Switches on American Railways (Die Weichen Amerikanischer Eisenbahnen). Dr. Blum & E. Giese. Notes of inspection on American railways, with illustrations of switches and frogs used on the Pennsylvania, New York Central, and Illinois Central railroads. 2500 w. Zeitschr d Ver Deutscher Ing—March 17, 1906. No. 76200 D.

## Switching.

Gravity Switching in Railway Yards. Explains the operation of the gravity system, referring to the Edge Hill yard, near Liverpool, England. 2500 w. Eng News—March 22, 1906. No. 75653.

Summit or Hump Yards for Gravity Switching. Abstract of the report of the Committee on Yards and Terminals, presented at meeting of the American Railway Engng. & Main. of Way Assn. 1200 w. Eng News—March 22, 1906. No. 75654.

## Switzerland.

The Davos - Filisur Railway (Die Bahnlinie Davos-Filisur). P. Saluz. A description of the new line to connect the Rhaetikon Railway with the interior of the Engardine. Map and profile are given, and details of bridges. 1600 w. Schweiz Bauzeitung—March 24, 1906. No. 76249 B.

## Tehuantepec.

The Isthmus of Tehuantepec and Its Inter-Ocean Railway. A report on the construction of a railway across this isthmus, and its possible relation to the Panama Canal. Ills. 2000 w. Sci Am Sup—April 7, 1906. No. 75928.

## Terminals.

Electric Equipment and Reconstruction of the New York Terminal Lines and Grand Central Station, New York Central & Hudson River R. R. A finely illustrated article summarizing this great work now in progress which is to cost about \$60,000,000. 12000 w. Eng News—Nov. 16, 1905. No. 73218.

Improvements of the New York Central & Hudson River Within the Electric Zone. G. R. Wadsworth. Illustrates and describes the Marble Hill cut-off, the

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Port Morris Branch depression, elimination of grade crossings and special station improvements, and the four-tracking of the Hudson and Harlem divisions. 2000 w. R R Gaz—Vol. XXXIX., No. 19. No. 73087.

Terminal Yard Improvements of the New York Central & Hudson River R. R. Briefly outlines the conditions at this terminal before the commencement of improvements, and gives an illustrated account of the extensive work in progress. 3000 w. Eng Rec—Nov. 18, 1905. No. 73247.

The Marble Hill Cut-Off and Port Morris Branch, New York Central Terminal Improvements. Gives a general review of the conditions at the New York terminal of the N. Y. C. & H. R. R. R., and within the territory to be operated by electricity, describing this enormous engineering undertaking which will approximate \$60,000,000 in cost. Ills. 5000 w. Eng Rec—Nov. 4, 1905. No. 73061.

The New Weehawken Railroad Terminal Power Plant. Illustrated detailed description of an electric plant for the operation of the grain elevators, shops, &c., and the lighting of the large terminal yard and buildings of the West Shore R. R. 4500 w. Eng Rec—Nov. 11, 1905. No. 73145.

A Highland Railway Terminus. Brief illustrated description of the picturesque terminals of the Oban Railway, at Oban, Scotland. 400 w. Ry & Loc Engng—Dec., 1905. No. 73522 C.

Blair Furnace Freight Locomotive Terminal, Pennsylvania R. R. Illustrated description of a large locomotive terminal recently put into operation. 1500 w. Ry & Engng Rev—Dec. 23, 1905. No. 74001.

The Washington Terminal. Theodore Starrett. An illustrated description of this beautiful terminal station in process of construction. 1800 w. Arch Rec—Dec., 1905. No. 73609 C.

Terminal Improvements of the Boston & Maine R. R. in Boston. Illustrated account of recent improvements at this important terminal, which covers 637 acres. 1600 w. Ry & Engng Rev—Jan. 20, 1906. No. 74484.

The East Altoona Freight Terminal of the Pennsylvania Railroad. Illustrated detailed description of these recently enlarged yards, which are said to handle the largest freight tonnage of any single system of freight yards in the world. 4200 w. Ry Age—Jan. 19, 1906. No. 74470.

The New Hoboken Freight Terminal of the Lackawanna R. R. Plan and description of the proposed arrangement of

freight terminal piers and slips. 1800 w. Eng Rec—Jan. 6, 1906. No. 74278.

East Altoona Freight Locomotive Terminal. This large locomotive terminal of the Pennsylvania railroad is illustrated and described. 1800 w. Am Engr & R R Jour—Feb., 1906. Serial. 1st part. No. 74851 C.

Recommendations of the Government Commission Appointed to Report upon the Improvement of the Railway Connections of Amsterdam (Verslag van de Staatscommissie tot het Instellen van een Onderzoek naar de Wijze van Verbetering der Spoorwegverbindingen om Amsterdam). R. A. van Sandick. An exhaustive review of the report of the Commission, with maps, profiles, and sections. 8000 w. 2 plates. De Ingenieur.—Feb. 3, 1906. No. 75153 D.

Southern Pacific Terminal Depot at Alameda Mole. Illustrated detailed description of the terminal arrangements recently built to replace the terminal destroyed by fire. 1200 w. Ry Age—Feb. 16, 1906. No. 75035.

The Operation of a Busy Terminal District. C. H. Ketcham. Suggestions for organization and management, with a brief description of working at the Hoboken terminal of the D., L. & W. R. R. Also discussion. 10000 w. Pro N Y R R Club—Jan. 19, 1906. No. 75089.

East Altoona Engine Terminal of the Pennsylvania. Rodney Hitt. Illustrated description of a new terminal which handles more engines a day, probably, than any other engine terminal in the United States. 4500 w. R R Gaz—Vol. XL., No. 11. No. 75548.

The Atlantic Avenue Terminal of the Long Island Railroad. Illustrated description of this new terminal built in connection with the extensive improvements and electrification of this line. 3500 w. Eng Rec—March 3, 1906. No. 75402.

Yards and Terminals. Abstract of a report presented at meeting of the Am. Ry. Engng. & Main. of Way Assn., with discussion. 3800 w. Ry Age—March 23, 1906. No. 75820.

Railway Terminals on San Francisco Bay. Map, with explanation of the location and topography and the lines now built or under construction. Considers the terminals on the Oakland side of the bay, ferry systems across the bay, and the Southern Pacific terminals in San Francisco. 2000 w. Ry Age—April 20, 1906. No. 76166.

The Transformation of the Railway Station at Lausanne (La Transformation de la Gare de Lausanne). A description

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## Terminals

of the important extension of the Simplon-Jura station at Lausanne in view of the increased traffic expected upon the opening of the Simplon tunnel. 1500 w. 1 plate. Bull Tech de la Suisse Romande—March 10, 1906. No. 76265 D.

Victoria Station. Plans and description of reconstruction work of Victoria Station in London, now in progress. 3000 w. Engr, Lond—May 25, 1906. No. 77146 A.

Freight Terminal Facilities at St. Louis. Information from an interesting report made by Robert Moore and Albert T. Perkins, concerning the freight facilities of St. Louis and what is needed to make them equal to the growing needs. 1200 w. R R Gaz—Sept. 21, 1906. No. 79405.

Progress of the New York Central & Hudson River R. R. Terminal Improvements in New York City. Brief illustrated article describing the progress in this great undertaking. 1000 w. Eng Rec—Sept. 8, 1906. No. 79037.

The New Terminal Station and Ferry-House of the Delaware, Lackawanna & Western R. R. at Hoboken, N. J. Charles C. Hurlbut. Illustrated detailed description of a fireproof structure erected entirely over water and possessing unique features. 7500 w. Eng News—Sept. 20, 1906. No. 79283.

New Passenger Terminal of the Chicago & North-Western at Chicago. An account of this new station which will provide complete separation of passengers and freight traffic. 600 w. R R Gaz—Oct. 12, 1906. No. 79751.

The New Freight Terminal at St. Louis of the Rock Island-Frisco Lines. Plan, elevation and details are illustrated and described. 800 w. R R Gaz—Oct. 12, 1906. No. 79752.

The Plant of the Pittsburg and Lake Erie Railway at Pittsburg (Die Anlagen der Pittsburg und Lake Erie Eisenbahn in Pittsburg). E. Giese and Dr. Blum. With plans of the station yards and general terminal arrangements at Pittsburg, and at McKees Rocks, as viewed by two German engineers. 3500 w. Zeitschr d Ver Deutscher Ing—Oct. 6, 1906. No. 79906 D.

The Railroad Terminal Problem. Editorial on the necessary reconstruction of important passenger stations, especially the great stations of large cities, the demands of the public, the immense cost, etc. 1500 w. R R Gaz—Oct. 26, 1906. No. 80086.

## Third Track.

Lackawanna Third-Track Work at

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## Tracks

Scranton, Pennsylvania. Hugh Rankin. Explains the causes of congestion at Scranton, and the new third track to relieve the conditions. Many illustrations of interesting work. 2000 w. R R Gaz—Vol. XL., No. 11. No. 75549.

## Ties.

Steel Cross Ties. W. F. Miller. Presents illustrations of types that have attracted attention, giving descriptions and other information. Discussion. 5000 w. Pro Engrs' Soc of W. Penn—March, 1906. No. 75620 D.

Ties. Abstract of report presented at meeting of the Am. Ry. Engng & Main. of Way Assn., with discussion. 15800 w. Ry Age—March 23, 1906. No. 75818.

Ties—The Supply and Demand. Gives an outline of the sources of supply and an estimate of the number of ties required annually, with an account of efforts being made to provide for the future supply. 2500 w. R R Gaz—Vol. XL., No. 11. No. 75544.

Concrete Railroad Ties. G. H. Kimball. Considers the present status of the tie question, giving a practical example of a concrete tie that has withstood the test of time and traffic. Ills. 2000 w. Cement Age—April, 1906. No. 76029.

Metallic Cross Ties (Der Eiserner Oberbau). A review of the possibility of replacing wooden sleepers with some form of metallic tie which shall be commercially and structurally practicable. 3500 w. Stahl u Eisen—March 15, 1906. 76227 D.

A Review of the Railway Tie Situation. Discusses the diminution in the sources of supply: tie-preserving, use of steel and concrete ties, spacing, size, life, etc. 3000 w. Eng News—May 3, 1906. No. 76479.

The Carnegie Steel Tie. An illustrated article explaining results obtained by the use of steel ties and giving information relating to them. 1000 w. R R Gaz—July 20, 1906. No. 78058.

Steel and Concrete-Steel Ties on the L. S. & M. S. Ry. An account of the experiments made on this road with the designs invented by C. Buhner. Ills. 2000 w. Ry & Engng Rev—Aug. 18, 1906. No. 78653.

## Tracks.

Effect of Rolling Stock on Track. Hugh Steele. Read before the New England R. R. Club. Discusses damage done by worn wheels, trailing obstructions from trains, water, &c., especially in large yards and terminals. 1300 w. Ry & Engng Rev—Dec. 16, 1905. No. 73785.

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## PERMANENT WAY AND BUILDINGS • Tunnel Ventilation

**Kansas City-Topeka Double Track Work of the Union Pacific.** An illustrated account of improvements amounting practically to rebuilding the line between the cities named. 3000 w. *R R Gaz*—Vol. XXXIX., No. 23. No. 73652.

**The Evolution of Railway Track (L'Evolution des Voies de Chemins de Fer).** M. Mesnager. An examination of the deformation of rails and joints under the action of high-speed trains. 1800 w. *Génie Civil*—Dec. 9, 1905. No. 73816 D.

**Track Construction with Steel Longitudinals on the Pennsylvania R. R.** Gives illustrations showing a construction that is to be tried which is a remarkable departure from the systems in use. It is the invention of Gustav Lindenthal. Also editorial. 1600 w. *Eng News*—Nov. 30, 1905. No. 73551.

**Five Years of Heavy Track Construction (Fünf Jahre Starkstoss Oberbau).** A. Haarmann. An account of the behaviour of a section of railway between Hasbergen and Osnabrück, comparing the behaviour of steel and wooden cross-ties. 5000 w. *Glaser's Aunalen*—March 1, 1906. No. 75722 D.

**The Deformations of Railway Track (Sur les Déformations des Voies de Chemins de Fer).** G. Cuénot. A study of the influence of cross ties of different kinds upon the transversal, vertical and longitudinal movements of the rails. Experiments were made with sleepers of wood, steel, and steel and wood combined. 1200 w. *Comptes Rendus*—March 26, 1906. No. 76222 D.

**Screw Spikes and Wooden Tie-Plates for Railway Track.** Illustrates and describes the Thiollier system of rail fastenings which is in use in Europe, and is being tested by the Pennsylvania Lines. 1700 w. *Eng News*—June 21, 1906. No. 77415.

**Track Elevation at Chicago on the Pittsburgh, Ft. Wayne & Chicago Ry.** An illustrated description of the methods employed, which are of interest because of the height to which the tracks were raised, and the narrow space in which the work was done. 1200 w. *Eng Rec*—June 23, 1906. No. 77428.

**The Problem of Track Support.** Samuel E. Duff. A study of various systems of track support favoring the longitudinal system of steel. Ills. 4000 w. *Ind Wld*—Aug. 25, 1906. No. 78829.

**The Relation of Track Construction to Speed and Weight of Trains.** Gives information obtained in reply to an inquiry as to the conditions on a number of rail-

ways of different classes. 2000 w. *Eng News*—Sept. 13, 1906. No. 79170.

## Track Elevation.

**Kinzie Street Track Elevation of the Chicago & North-Western, Chicago.** An illustrated description of an interesting piece of work with difficult features. 2000 w. *R R Gaz*—Vol. XXXIX., No. 19. No. 73089.

**Chicago & Western Indiana Track Elevation at Chicago.** Illustrations and descriptive notes on the work done in 1905. Earlier work having been previously described. 1000 w. *Ry Age*—March 23, 1906. No. 75815.

## Train Shed.

**Smokeless Train Shed.** Illustrated description of the new train shed of the D., L. and W. Ry. in Hoboken, N. J. 1600 w. *Ry & Loc Engng*—Aug., 1906. No. 78386 C.

## Transition Curves.

**Setting Out and Checking Circular and Transition Curves in Railway Track.** Illustrated description of a simple instrument, designed by F. A. Smith, by which the section foreman can check the accuracy of his curves. 1600 w. *Eng News*—Nov. 16, 1905. No. 73221.

**Transition Curves on the Southern Pacific R. R.** An explanation of methods employed by the engineering department of this road, illustrated by example. Diagram and tables. 1400 w. *Eng Rec*—Nov. 11, 1905. No. 73140.

## Tunnels

**A Study of Air Resistance in Railroad Tunnels (Studie über den Luftwiderstand von Eisenbahnzügen in Tunnel Röhren).** O. Stix. A theoretical investigation, deriving formulas for computation, with applications to the Gotthard and Simplon tunnels. 2000 w. *Schweiz Bauzeitung*—July 28, 1906. No. 78728 B.

See Civil Engineering, Construction.

## Tunnel Tracks.

**Track Construction for Railway Tunnels.** Gives particulars as to practice, experience and opinions on railways in this country and in England, with editorial discussion of the conditions affecting track and maintenance of way in tunnels. Ills. 6000 w. *Eng News*—Sept. 20, 1906. No. 79286.

## Tunnel Ventilation.

**The Ventilation of the Kaiser Wilhelm Tunnel at Cochem, Rhenish Prussia (Die Lüftungsanlage des Kaiser-Wilhelm Tunnel bei Cochem).** A. Haas. Describing very fully the installation of a modification of the Saccardo system to

# RAILWAY ENGINEERING

## Wabash

the ventilation of the longest tunnel in Germany; the use of petroleum fuel in the locomotives caused much smoke. 6000 w. 2 plates. Glasers Annalen—Aug. 15, 1906. No. 79336 D.

## Wabash.

Wabash Eastern Improvements. An illustrated article describing improvements at the Wabash-Pittsburg terminal, and at Jewett, Ohio, where the connection is made with the Wheeling & Lake Erie, and other points. 1800 w. R R Gaz—April 27, 1906. No. 76378.

## Warehouse.

A Large Railway Freight House and Warehouse at Pittsburg, Pa. A warehouse and freight station which provides numerous private rooms for independent firms, is illustrated and described in detail. 3500 w. Eng News—July 19, 1906. No. 78067.

The Ventilation of Tunnels. Charles S. Churchill. Discusses recent improvements made, and additional facts obtained as to the condition of the air in some of the subways and tunnels of Europe. Ills. 5000 w. Pro Am Soc of Civ Engrs—Aug., 1906. No. 78871 E.

## Washout.

Colorado River Crevasse—Salton Sea—Southern Pacific Tracks. Official statement of the causes and results of the misfortunes in the irrigation project of Southern California. I. The Causes of the Flood and Results of Efforts to Stop It. C. R. Rockwood. II. How the Flood Affected the Southern Pacific Railway. C. H. Ellison. 5000 w. Ry Age—March 23, 1906. No. 75813.

## Water Station.

The Water Supply Plant at the Speldorf Station (Die Wasserversorgungs-

## TRAFFIC

## Car Supply

anlage auf Bahnhof Speldorf). S. Lamm. Details of the water tower and pumping plant for locomotive supply at the Speldorf division station on the Essen line of the Westphalian railways near Duisburg. Serial. Part I. 1000 w. Glasers Annalen—Nov. 15, 1905. No. 73819 D.

## Water Tanks.

Protecting Railway Water Tanks from Freezing. Presents the available means of protecting water tanks as given in a committee report made to the Assn. of Ry. Supts. of Bridges & Bldgs. Ills. 1500 w. Eng News—Nov. 2, 1905. No. 72956.

## Wilmington.

Pennsylvania Improvements at Wilmington, Del. Illustrates and describes extensive improvements, including a brick arched viaduct, massive stone retaining walls, plate girders, drawbridge, changes of track, a new passenger station and office building, etc. 2500 w. Ry Age—Nov. 3, 1905. No. 73048.

## Yardmaster.

The Work of a Yardmaster. J. D. Tyler. Read before the New England R. R. Club. Discusses the qualifications and training needed and the character of the work. 2200 w. Ry & Engng Rev—Nov. 18, 1905. No. 73268.

## Yards.

New East Bottoms Yard of the Missouri Pacific at Kansas City. Plan and description of the enlargement and complete rearrangement of this yard. 1200 w. R R Gaz—May 11, 1906. No. 76611.

New Freight Yard at Alexandria, Va., for the Washington Southern Ry, and the Richmond, Fredericksburg & Potomac R. R. W. A. MacCart. Plan and profile with descriptive notes. 1200 w. Eng News—Nov. 30, 1905. No. 73553.

# TRAFFIC

## Accounting.

Underlying Principles and General Practices of Railway Accounting Departments. From a lecture by J. L. Burgess, at the Iowa State College. Considers the importance of the accounting department, the duties of accounting officers, the methods, &c. 3000 w. Ry & Engng Rev—Dec. 23, 1905. Serial. 1st part. No. 74000.

## Car Service.

Division of Foreign Cars—Remedies Suggested. J. W. Midgley. Considers instances of unfair division, the causes, and remedies. 3000 w. Ry Age—July 27, 1906. No. 78291.

Weak Points in the Car Service Rules and the per Diem Code. J. W. Midgley. A discussion of certain points showing the conditions and need of remedy. 3800 w. Ry Age—July 20, 1906. No. 78096.

Remedies for Diversion of Freight Cars. J. W. Midgley. Gives suggested remedies, discussing their merits. 3000 w. Ry Age—Aug. 10, 1906. No. 78512.

## Car Supply.

Ways and Means to Maintain Car Supply. L. C. Bihler. Abstract of an Address before the Traffic Club of Pittsburg. Calls attention to features needing correction, and the need of practical co-

# RAILWAY ENGINEERING

## Clearing House

operation between shippers, motive power, operating and traffic departments of railroads. 1700 w. Ry Age—Feb. 23, 1906. No. 75251.

## Clearing House.

Early Proposals to Form a Clearing House in Connection with Trunk Line Associations. J. W. Midgley. Reviews the various schemes for establishing a railway clearing house, explaining the views of various railway men. 5000 w. Ry Age—Nov. 10, 1905. No. 73102.

Car Clearing Houses, Car Pools, etc. J. W. Midgley. Discussing remedies for the misuse of freight cars. 3500 w. Ry Age—Oct. 5, 1906. No. 79644.

## Coal.

Great Northern Railway Coal Traffic. An illustrated account of the heavy traffic handled by this railway. 1500 w. Ir & Coal Trds Rev—May 18, 1906. No. 77024 A.

## Co-operation.

Co-operation. Henry W. Thornton. Read before the Traffic Club of Pittsburg. Discusses co-operation between the traffic and operating departments of the same railroad, and co-operation between a railroad and an industry. 6000 w. R R Gaz—Aug. 31, 1906. No. 78966.

## Demurrage.

The Implements and Causes of Demurrage Controversies. Ashley J. Elliott. Discusses some of the problems of car service. 4500 w. Pro St Louis Ry Club—Dec. 9, 1905. No. 74179.

## Development.

Union Pacific. Maps and review of the annual statement of this road, with editorial on the policy of main line development and the extension of branch lines. 5500 w. R R Gaz—Vol. XXXIX., No. 24. No. 73738.

## Earnings.

New York Central & Hudson River. Reviews this road for the past year, showing great growth in earnings, large progress in the work of electrifying the New York terminal, additional electric properties acquired, and general improvements. 2000 w. R R Gaz—May 4, 1906. No. 76493.

## Freight.

Handling Fast Freight in England. An account of the extravagant development of this type of traffic in England. 2000 w. R R Gaz—Vol. XXXIX. No. 21. No. 73431.

Handling Freight so as to Avoid Losses. Extracts from an address on loss and damage and its effects upon railroad reve-

## TRAFFIC

nue, delivered to the freight agents of the N. Y. C. & H. R. R., by R. L. Calkins. 2200 w. R R Gaz—Vol. XXXIX. No. 19. No. 73091.

Time Freight on the Erie. Describes the system of handling and keeping a record of the movement of fast freight. The principle on which it is based is the grouping of cars containing freight of similar classification from one point to another point and making one manifest for the group of cars. 2000 w. R R Gaz—Vol. XXXIX. No. 20. No. 73227.

Hutchins' Freight Arrival Record Forms. Describes the scheme of F. Lincoln Hutchins in use on the Boston & Maine. 1400 w. R R Gaz—Aug. 3, 1906. No. 78414.

Some Principles of Freight Traffic Working. W. T. Stephenson. Read before the British Assn. Discusses recent improvements in freight traffic working, —the use of powerful engines and large train loads, the increase in wagon load, etc. 4000 w. Ir & Coal Trds Rev—Aug. 31, and Sept. 7, 1906. Serial. 2 parts. No. 79243, each A.

## Industrial Commissioner.

The Industrial Department. A review of the history of the railroad industrial department, with editorial on the work of the industrial commissioner. 5800 w. R R Gaz—Vol. XXXIX., No. 25. No. 74013.

## Interchange.

Interchange of Traffic Between Electric Lines and Steam Railroads. C. A. Paul. Read before the Nat. Assn. of Ry. Agents. Reviews the electric traction situation in its relation to the steam railroads, and the changes taking place, with remarks on future possibilities. 1000 w. R R Gaz—Oct. 26, 1906. No. 80088.

## Loading.

Classification of Locomotives for Tonnage Rating Purposes. J. H. Lonie. Explains a method of classification used on the Rock Island System. 1000 w. Am Engr & R R Jour—Dec., 1905. No. 73529 C.

## Locomotive Loading.

Loading of Locomotives on the Equated Tonnage of Drawbar-Pull Basis. J. M. Daly. Discusses the proper method of rating and loading locomotives, giving illustrated description of a computing device that automatically registers the number of cars in train and adjusts the drawbar-pull of each gross weight of car at each location in the train. Lengthy discussion of interest. 15500 w. Pro N Y R R Club—Oct. 20, 1905. No. 73409.

# RAILWAY ENGINEERING

## Mexico

### Mexico.

**Mexican Railroads and Railroad Traffic.** Samuel H. Barker. Concerning the working of government regulation of railroad rates, and the development of railroads. 2500 w. R R Gaz—Sept. 28, 1906. No. 79497.

### Pooling.

**Car Clearing Houses and Car Pools—Benefits from Their Establishment.** J. W. Midgley. An investigation of the subject of car pools, a car clearing house, an equipment company, and what has been termed a "legal tender" car, with the object of promoting economy and efficiency through the best possible employment of freight cars. 3000 w. Ry Age—June 1, 1906. No. 77084.

**Car Pooling—Need of Remedy for Unfair Diversion of Foreign Cars.** J. W. Midgley. A discussion of this problem and the difficulties in solving it. 3000 w. Ry Age—June 22, 1906. No. 77463.

### Railroad Rates.

See Industrial Economy.

### Rate Regulation.

**The President on Rate Regulation.** Condensed abstract of the portion of the President's message which treats of railroad rate regulation. 2000 w. R R Gaz—Vol. XXXIX., No. 23. No. 73651.

### Rates.

**Government Regulation of Railway Rates.** B. H. Meyer. Read before the Am. Econ. Assn. An argument in favor of government control of railways. 4300 w. Ry Age—Jan. 5, 1906. No. 74208.

**Proposed Solutions of the Railway Rate Problem.** H. T. Newcomb. Abstract of a paper presented at meeting of the Am. Association for the Advancement of Science. A discussion of certain principles in connection with the measures proposed for new legislation. 5500 w. Ry Age—Jan. 5, 1906. No. 74207.

**Argument against Two-cent Passenger Rate in Ohio.** James McCrea. Address before House committee on railroads and telegraphs of the Ohio Legislature. 3000 w. Ry Age—Feb. 9, 1906. No. 74958.

**Senator Lodge on Rate Regulation.** Abstract from speech on rate regulation in the United States Senate, Feb. 12. 4000 w. R R Gaz—Vol. XL. No. 8. No. 75240.

**Rate Making on the Trunk Lines.** Abstract of an article by Prof. William Z. Ripley, in the Feb. issue of the *Quarterly Journal of Economics*. 2800 w. Ry Age March 2, 1906. No. 75348.

**Senator Foraker's Speech.** Extracts from speech before the U. S. Senate in

## TRAFFIC

## Tonnage

opposition to the Hepburn Bill. Considers it unworkable and unconstitutional. 6800 w. R R Gaz—Vol. XL., No. 10. No. 75443.

**The Reform of Passenger Rates in Germany.** Translated from *Zeitung des Vereins*. 4000 w. Bul Int Ry Cong—Feb. 1906. No. 75416 E.

**The Railroad Rate Bill.** Full reproduction of the Hepburn bill in the form in which it went into the hands of the committee. 7000 w. R R Gaz—May 25, 1906. No. 76967.

**The Standard Oil Co.'s Low Railroad Rates.** Gives extracts from Mr. Garfield's report in regard to discriminations made in favor of the Standard Oil Co., and some of the replies from the railroads. 1500 w. R R Gaz—May 11, 1906. No. 76614.

**Chicago-St. Louis Differentials to Trans-Missouri Points.** An explanation of the demands which are being investigated with a view to the re-adjustment of freight rates. 3000 w. Ry Age—Aug. 10, 1906. No. 78511.

### Report.

**Pennsylvania Railroad.** Editorial review of the report of the last year and its evidence of remarkable prosperity. 4300 w. R R Gaz—Vol. XL., No. 10. No. 75440.

### Standard Code.

**The New Standard Code.** H. W. Forman. Reviews the whole code, discussing rules and suggesting amplifications. 4000 w. R R Gaz—Aug. 10, 1906. Serial. 1st part. No. 78521.

### Statistics.

**Traffic Statistics and Freight Train Working.** Considers statistics from the working point of view, aiming to show the difficulties in their application, the best methods of handling them, and in what directions improvements may be made. 4000 w. Ir & Coal Trds Rev—March 30, 1906. No. 76019 A.

### Terminals.

**How Best to Get Cars Through Large Terminals.** W. H. Smith. Read before the Northern Ry. Club. Discusses briefly the changed conditions and suggests a system for forwarding cars. 1300 w. R R Gaz—Sept. 14, 1906. No. 79193.

### Tonnage.

**The Coal Carriers.** Frederick E. Seward. Shows the importance of tonnage to the railroads, giving some idea of the annual haulage, especially from the coal territory. 2200 w. R R Gaz—Vol. XXXIX., No. 23. No. 73650.

**Daily Train Tonnage Chart—C. & E. I.** Gives a chart devised by H. I. Miller

# RAILWAY ENGINEERING

## Ton-Mile

which gives for instant inspection all the essential information relative to one day's northward freight train movements, with explanation. 700 w. R R Gaz—Vol. XL, No. 4. No. 74579.

Tonnage Rating for Locomotives. Extracts from a paper by F. W. Thomas. Methods for calculating the rating are explained, and the factors entering into the resistance column. 1800 w. R R Gaz—Sept. 21, 1906. No. 79401.

## Ton-Mile.

Ton-Mile Railway Statistics, and Railway Rates and Terminal Charges. R. Price-Williams. Gives a tabular statement showing the value of the ton-mile principle as applied to ascertaining goods and mineral traffic receipts, with discussion of this and related subjects. 1500 w. Ir & Coal Trds Rev—Oct. 27, 1905. No. 73-012 A.

## MISCELLANY

## Costs

### Traffic.

The Development of American Railway Traffic (Die Entwicklung des Amerikanischen Eisenbahnwesens). Bruno Simmersbach. A tabulated study of the growth in mileage and traffic of American railroads, with data concerning costs and operation. 4500 w. Glasers Annalen—Jan. 1, 1906. No. 74616 D.

### Train Operation.

A Graphic Record of Train Operation. Gives a reduced chart made by a recording machine and a statement of the information shown on it. 1500 w. Ry Age—June 8, 1906. No. 77203.

### Warehouses.

Relation of Warehousing to Transportation. Ashley J. Elliott. Urges the same diligence in unloading cars as is exercised in unloading vessels. 2500 w. Pro St Louis Ry Club—Aug. 10, 1906. No. 79254.

## MISCELLANY

### Acceleration.

Acceleration and Some Locomotive Problems. William G. Raymond. Gives a brief statement of principles and the development of working formulas for determining the acceleration. 4500 w. R R Gaz—Sept. 14, 1906. No. 79191.

### Address.

Address of President Ball to the Master Mechanics Association. Discusses progress and improvements of the last ten years, the motive power problem, and other topics of interest. 4500 w. Am Engr & R R Jour—July, 1906. No. 77759 C.

### American Railways.

The German Report on North American Railways. Balthasar H. Meyer. A review of the report of the engineers who visited the United States at the time of the Louisiana Purchase Exposition. The remarks are mostly confined to the comparisons and opinions brought out. 3500 w. Ry Age—March 9, 1906. No. 75472.

### Anniversary.

Seventieth Anniversary of an English Railroad. W. B. Paley. Historical review of the South-Eastern Railway. Ills. 1200 w. R R Gaz—June 1, 1906. No. 77054.

### Ash Handling.

Economical Ash Handling. Views and description of the ash-pit designed and patented by C. R. Ord, two having been in operation for over two years have given perfect satisfaction. 1100 w. Ry & Loc Engng—Jan., 1906. No. 74201 C.

### Avalanches.

Experiences with Landslide Protection in Austria (Ueber Erfahrungen im Lawinenverbau in Oesterreich). Vincenz Pollack. Data concerning the effectiveness of protection works in the Austrian Alps against avalanches, snow slides, and wind in various grades. Serial. Part I. 4000 w. 1 plate. Zeitschr d Oesterr Ing u Arch Ver—March 9, 1906. No. 75735 D.

Fighting the Avalanche. Describes the action of avalanches as seen on the Canadian Pacific Railway, and the defense works for keeping railway lines open, and of overcoming blockades. Ills. 1600 w. Ry & Loc Engng—March, 1906. No. 75486 C.

### China.

The Railways of China (Les Chemins de Fer de Chine). A general account of recent railway work in China, with map of existing and projected lines. 2500 w. Génie Civil—Feb. 24, 1906. No. 75716 D.

### Colonial Railways.

Colonial Government Railways. Discusses the conditions governing the extension and management of railways constructed and worked by a State, with special reference to the Australian Colonies. 1200 w. Engng.—Jan. 19, 1906. No. 74746 A.

### Costs.

Unit Costs of Railroad Building. This first paper of a series considers eastern railroads of a first class character, with steel spans, concrete abutments and piers,



# RAILWAY ENGINEERING

## Early Railways

80-lb. rail, stone or gravel ballast and permanent construction throughout. Ills. 500 w. R R Gaz—Sept. 7, 1906. Serial 1st part. No. 79102.

## Early Railways.

The First Railway in America. E. W. Hilgert. A brief account of a tramway built in 1809 by Thomas Leiper. 1000 w. Sci Am Sup—Aug. 18, 1906. No. 78623.

## Easement Damages.

The Park Avenue Cases. Editorial review of a legal suit and a recent decision of the Supreme Court which will cost the New York Central Railroad some millions of dollars in damages. 2000 w. R R Gaz—Vol. XL. No. 6. No. 74945.

## Education.

Railway Education. Prof. E. R. Dew-snip. Suggestions for the special training of railroad education of men already in the service. 6000 w. Pro St Louis Ry Club—Jan. 12, 1906. No. 74794.

## England.

Work of the English Railway and Canal Commission. Abstract of a paper by S. J. McLean in the *Quarterly Jour. of Economics*. Reviews the actual results obtained during the last 17 years by a body possessing many of the functions proposed for the Interstate Commerce Commission. 2500 w. R R Gaz—Vol. XXXIX. No. 21. No. 73436.

## Gulf Routes.

Railroad Routes to the Gulf. Editorial discussion of the changes to secure gulf connection, and the advantages and disadvantages of gulf ports, especially in regard to the export of grain. 2500 w. R R Gaz—Vol. XL. No. 3. No. 74452.

## Hepburn Law.

The Hepburn Law. A Brief Review. Editorial on the changes in the law. 2200 w. R R Gaz—Aug. 3, 1906. No. 78413.

## Hindustan.

The Railways of Hindustan. (Die Eisenbahnen Vorderindiens). Dr. Blum & E. Giese. Describing especially the stations, terminal connections and operative methods of the principal railways of the peninsula; with map. Two articles. 7500 w. Zeitschr d Ver Deutscher Ing—Feb. 17, 24, 1906. No. 75700 each D.

## Ireland.

Irish Railways. Reviews what has been done previously for Irish railways in the present number, and gives the names of members of a Vice-Regal Commission to inquire into the present conditions and reports how far they afford

## MISCELLANY

adequate facilities, etc. 2800 w. Engr, Lond—Aug. 24, 1906. Serial. 1st part. No. 79018 A.

## Italy.

The History and Organization of Italian Railroads. Edward P. North. Historical review, with map. 1200 w. R R Gaz—Sept. 28, 1906. No. 79496.

## Japan.

Official Statistics of Japanese Railways. Slason Thompson. An illustrated article giving a summary, taken from the latest annual report, concerning the nationalization of 17 private railways. 500 w. Ry Age—Oct. 12, 1906. No. 79763.

## Legislation.

Recent State Railroad Commission Legislation. Frank Haigh Dixon. Abstract of an article in the Pol Sci Qr. Considers the acts passed in Washington, Indiana, Kansas, and Wisconsin, providing for the creation of state railroad commissions. 3000 w. R R Gaz—Vol. XL. No. 4. No. 74581.

## Mexico.

Railroad Regulation by Law in Mexico. Erdis G. Robinson. Gives some of the important provisions in the excellent railroad law in operation in Mexico. 3500 w. Eng News—Sept. 6, 1906. No. 79089. The Railroads of Mexico. Harry E. Maule. A review of the existing railways, especially those serving the mining business. 2500 w. Min Wld—Sept. 15, 1906. No. 79210.

## Mortgages.

Types of Railroad Mortgages. Thomas W. Mitchell, in the *Journal of Accountancy*. An explanation of the various types of mortgages and the purposes they serve. 3500 w. R R Gaz—July 6, 1906. No. 77812.

## Organization.

Organization of the Pennsylvania Railroad, 1906. An abstract made from comments in a paper by A. J. County, on the division of responsibility throughout the system. 4000 w. R R Gaz—July 13, 1906. No. 77948.

## Railroad History.

Two Object Lessons in Railroad History. A comparison of progress and conditions of the railroads in the Housatonic and the Naugatuck valleys, both roads having become a part of the N. Y., well as on the product. 1500 w. Ir. Gaz. Vol. XL. No. 7. No. 75020.

## Railway Congress.

Official Information Issued by the Permanent Commission of the Railway Congress. Summary of the proceedings of the seventh session at Washington, D. C.,

## STREET AND ELECTRIC RAILWAYS

### Review

1905. 12600 w. Tables. Bul Int Ry Cong—Sept., 1905. No. 73401 H + F.

### Review.

A Review of the Railroad Year. An interesting general review of the progress, the construction, electrification, etc. 2500 w. R R Gaz—Vol XL, No. 1. No. 74210.

### Siam.

Railroads and Transportation in Siam. L. E. Bennett. An illustrated account of the work thus far accomplished, with the history, cost of construction, etc. 3800 w. R R Gaz—June 1, 1906. No. 77053.

### Siberia.

A Lost Railroad. L. Lodian. Relates an interesting historic incident in the construction of the Trans-Siberian railway. 2500 w. Elec Rev, N Y—June 30, 1906. No. 77737.

### Statistics.

Length and Cost of Construction of the Railways of the World (Longuer et Prix d'Établissement des Chemins de Fer). A tabulated view of the mileage, territory and population served, and general cost of the railways of the world at the close of 1903. 2000 w. Génie Civil—Dec. 16, 1905. No. 74626 D.

### Ballast

Railroad Statistics. A. A. Goodchild. Read at Dec. meeting of the Canadian Ry. Club. Outlines the great number of incidentals necessarily included in railway management, discussing ways of bettering present methods, and making the statistics more valuable. 5000 w. R R Gaz—Vol. XL, No. 3. No. 74454.

### Supplies.

The True Perspective of the Supply Department. George Yeomans. A short paper with lengthy discussion on the importance of this department of railways. 1600 w. Pro W Ry Club—Dec. 19, 1905. No. 74350 C.

Testing and Inspection of Railroad Supplies. Robert Job. Gives an outline of some of the important test work carried out regularly on the Philadelphia & Reading Railway. 2000 w. Jr Fr Inst—July, 1906. No. 78009 D.

### Surcharges.

The Surcharge Problem. C. J. Morrison. Discusses the surcharges on a modern railway shop, and when it is an advantage to purchase instead of manufacture. 1200 w. Am Engr & R R Jour—Oct., 1906. No. 79601 C.

## STREET AND ELECTRIC RAILWAYS

### Acceleration.

An Electric Accelerometer. B. B. Owens. Describes a simple and reliable method of measuring acceleration of a railway car or other machine. Ills. 600 w. Can Soc of Civ Engrs—Nov. 2, 1905. No. 73745 D.

### Alabama.

Car House, Shops and Shop Practices at Birmingham, Ala. An illustrated detailed description of the car-housing and repair plant and its equipment. 3300 w. St. Ry Jour—May 5, 1906. No. 76529 C.

### Alpine Railway.

A Gravity Cable Railroad in the Swiss Alps. Illustrated description of the remarkable railway in the Swiss Alps, connecting Lauterbrunnen with Mürren. 1000 w. Sci Am—Feb. 24, 1906. No. 75085.

The Sernfthal Railway. Illustrated description of an electric railway through an Alpine valley famous for its beautiful scenery. 1600 w. Engr., Lond—Feb. 23, 1906. No. 75378 A.

### Alternating Current.

Alternating Current Track Circuits in the New York Subway. J. M. Waldron. Read before the Ry. Sig. Assn. at N. Y. An interesting description, with diagrams, showing the remarkable efficiency

of this system of automatic signals. 1400 w. R R Gaz—May 11, 1906. No. 76610.

### Apparatus.

Selection and Operation of Street Railway Apparatus. A. G. Rakestraw. The present article considers motors, trucks, gears, and methods of control. 3000 w. Sib Jour of Engng—Oct., 1905. Serial. 1st part. No. 73487 C.

### Australia.

The Freemantle (Australia) Municipal Tramways. Illustrated detailed description of the only municipal tramway in Australia. 3000 w. St Ry Jour—May 5, 1906. No. 76530 C.

### Axles.

Axle Failures on the District Electric Railway. From the report of Major J. W. Pringle to the Board of Trade, concerning the circumstances attending the fracture of two axles, which led to partial derailment. 3000 w. Mech Engr—July 28, 1906. No. 78463 A.

### Ballast.

Ballast. C. H. Clark. Read at the Columbus convention of the Am. St. & Int. Ry. Engng. Assn. An illustrated description of the practice and methods adopted at Cleveland, Ohio. Also reports

# STREET AND ELECTRIC RAILWAYS

## Baltimore

concerning steel ties. 1500 w. St Ry Jour—Oct. 20, 1906. No. 80027 C.

## Baltimore

The Reconstructed Baltimore System. An illustrated account of the damage to the system by the fire in Feb., 1904, and the work accomplished in the past two years, which has greatly improved the property and increased its efficiency. 3300 w. St Ry Jour—April 21, 1906. No. 76172 C.

## Belfast.

The Belfast City Tramways. Information of interest concerning these recently completed lines, with plans and sections of the generating station. 6800 w. Elect'n, Lond—Dec. 1, 1905. No. 73682 A.

The Belfast Tramways Undertaking. Illustrated detailed description. 2300 w. Elec Rev. Lond—Jan. 19, 1906. No. 74738 A.

## Berlin.

The Charlottenburg Subway (Die Untergrundbahn in Charlottenburg). P. Koch. With map showing the line from Berlin to the suburb of Charlottenburg, and illustrations of the work and the crossings. 1500 w. Elektrotech u Polytech Rundschau—May 17, 1906. No. 77660 D.

Plans for Reducing the Headway between Trains on the Berlin City Railway (Vorschläge zur Verkürzung der Zugfolgezeit auf des Berliner Stadtbahn). W. Wechmann. A discussion of traffic conditions on the Berlin elevated railway, with speed curves and signal systems, showing how the carrying capacity may be increased. 4000 w. Glasers Annalen—April 15, 1906. No. 76261 D.

New Transportation Projects for Berlin (Die Neuen Berliner Verkehrsprojekte). Adolf Müller. A review of the plans now under consideration for passenger transport in Berlin; including subways, motor omnibus lines, and tramways; with maps and plans of the various projects. Serial. Part I. 3500 w. 1 plate. Glasers Annalen—Feb. 1, 1906. No. 75121 D.

## Birmingham, Ala.

Recent Improvements in Birmingham, Ala. The present article gives an outline of the operations and properties of the Birmingham Railway, Light & Power Company. Ills. 2000 w. St Ry Jour—March 24, 1906. No. 75678 C.

## Boston Elevated.

New Power-Station Equipment of the Boston Elevated Railway Company. Illustrates and describes equipment which will increase the present power supply 10 per cent. It includes a d. c. 2000-kw. turbo

## Brakes

generator outfit to be added to the Dorchester station, a 875-kw. gas engine plant at Salem St. station, Medford; and a 700-kw. gas-engine plant for W. Somerville. 3000 w. St Ry Jour—Nov. 4, 1905. No. 73025 C.

## Boston Subway.

Washington Street Subway in Boston. An illustrated description, as given in the report of the Boston Transit Commission. 4000 w. R R Gaz—Vol. XL. No. 4. No. 74582.

The Washington St. Tunnel of the Boston Subway System. A report of the construction of this new tunnel for the accommodation of the elevated trains. Ills. 4500 w. Eng News—April 19, 1906. No. 76130.

## Bournemouth.

Electric Traction at Bournemouth. Illustrates and describes a combined conduit and trolley system with extensions in three boroughs. 2800 w. Tram & Ry Wld—Nov. 9, 1905. No. 73492 B.

## Bow System.

Regenerative Control and the Bow Collector. Gerald Hooghwinkel. Principally urging the use of the bow system and explaining its advantages. 1700 w. St Ry Jour—Aug. 11, 1906. No. 78495 C.

## Brakes.

Brakes. A. L. C. Fell. Read before the Tramways & Light Rys. Assn. A discussion of the question of brakes in construction with tramcars, considering the results thus far obtained. 3800 w. Elec Engr, Lond—Jan. 12, 1906. Serial. 1st part. No. 74511 A.

Brake-Rigging and Uneven Wear of Brake-Shoes. W. L. Boyer. Calls attention to faults in design and the conditions responsible for many of the troubles. Ills. 4000 w. St Ry Jour—July 21, 1906. No. 78073 C.

Advantages and Disadvantages of Different Systems of Tramway Brakes. Gives reports of M. Scholtes, and of M. Bjorkegren, and the conclusions reached by each. 6400 w. Elect'n, Lond—Sept. 7, 1906. No. 79223 A.

Some European Brakes and Their Value. John P. Fox. Describes the relation of braking to skidding, discussing American and English practice, and a series of tests made in England. 6800 w. St Ry Jour—Sept. 15, 1906. No. 79202 C.

Braking for Electric Cars. George C. Graham. Read before the N. Y. State St. Ry. Assn. Considers the systems in use, favoring the "Straight air" brake. Ills.

## STREET AND ELECTRIC RAILWAYS

### Buenos Aires

1500 w. St Ry Jour—Sept. 29, 1906. No. 79560 C.

Brakes for Tramway Cars. Henry M. Sayers. Discusses the requirements and the need of having two brakes on a car, special brakes for descending hills, etc. 1400 w. Elect'n, Lond—Sept. 28, 1906. Serial. 1st part. No. 79696 A.

Car Brakes. Henry Mozley. Read at conference of the Munic. Tram Assn. Gives the writer's experience at Burnley, explaining why the mechanical brakes with cast iron slippers were adonted, and describing the construction and operation. Ills. 3000 w. Elec Engr, Lond—Sept. 21, 1906. No. 79574 A.

Different Systems of Brakes. H. S. Williams. Read before the N. Y. State St. Ry. Assn. Principally a description of the systems of air brakes adaptable to electric cars with multiple-unit control. 2000 w. St Ry Jour—Sept. 29, 1906. No. 79561 C.

### Buenos Aires.

Buenos Aires Electric Tramways. Dr. Alfred Gradenwitz. Illustrates and describes the electrification and extension of the tramway system. 2500 w. Elec Rev, N. Y.—Jan. 27, 1906. No. 74726.

### Cables.

Underground Cables. H. G. Stott. Read at Columbus convention of the Am. St. & Int. Ry. Engng. Assn. Considers the insulation of high-tension cables, and discusses troubles and their remedies. 2300 w. St Ry Jour—Oct. 20, 1906. No. 80029 C.

### Cable Incline.

The Electric Cable Road at Nancy (Funiculaire Electrique de Nancy). G. E. Bernardet. Describing a cable incline railway from the city of Nancy to Saint Antoine, a resort about 150 feet above. The cable runs continuously driven by electric power, the number of cars being varied to meet the traffic. 4000 w. Mem Soc Ing Civ de France—Jan. 1906. No. 76233 G.

### Cable Railways.

The Passing of Cable Railways in the United States. Brief outline of the history of this system in Chicago and other cities. 1000 w. Eng News—Sept. 20, 1906. No. 79284.

### Cable Traction.

The Electric Cable Road at Nancy (Le Funiculaire Electrique de Nancy). G. E. Bernardet. Illustrating an inclined cable railway to the summit of a hill 229 metres high, near Nancy, France. The cable runs continuously, and the number of cars is varied to suit the traffic. 2000

### Car Wiring

w. 1 plate. Génie Civil—March 3, 1906. No. 75725 D.

### Car Equipments.

Car Equipment and Maintenance. S. D. Shenstone. Read before the Elec. Assn. of N. S. W. Information concerning direct-current tram car equipments, 5000 w. Aust Min Stand—Aug. 22 and 29, 1906. Serial. 2 parts. No. 79594, each B.

The Electric Car Equipment of the Long Island Railroad. W. N. Smith. The present number gives an illustrated detailed description of the all-steel cars to be used, to be followed by a full account of their electrical equipment, and of the tests by which the capacity of the motors were determined. 5500 w. St Ry Jour—Aug. 11, 1906. Serial. 1st part. No. 78493 C.

### Cars.

The Standard Surface Car of the Brooklyn Rapid Transit Company. Illustrated detailed description of a car recently adapted for service in surface lines, which is quite a departure from the usual type of semi-convertible cars. 2000 w. St Ry Jour—Nov. 18, 1905. No. 73234 C.

New Double-Deck Car of the Twin City Rapid Transit Company. Illustrates and describes a type of car for service on the interurban line to Lake Minnetonka. 1200 w. St Ry Jour—Oct. 6, 1906. No. 79638 C.

The New Cars of the South Side Elevated Railway, Chicago, and Their Equipment. Illustrated detailed description of new cars, seventy having just been built, and of their equipment. 3000 w. St Ry Jour—May 19, 1906. No. 76725 C.

The New Closed Car Adopted by the Schenectady Railway Company. An illustrated description of the interesting features of cars representing the most advanced practice. 1300 w. St Ry Jour—May 5, 1906. No. 76531 C.

Electric Street Cars for City Service. M. B. Starring, and H. B. Fleming. Illustrated detailed description of the Standard car for the Chicago City Railway Co., and its electrical equipment. Discussion. 10000 w. Jour W Soc of Engrs—June, 1906. No. 77504 D.

### Car Service.

Economy in Car Equipment, Weights and Schedules. E. H. Anderson. Read before the Am. St. & Int. Ry. Engng. Assn. Discusses the dynamic features of car service and the effect on the cost. 1400 w. St Ry Jour—Oct. 20, 1906. No. 80031 C.

### Car Wiring.

Good Wiring Practice on Cars at

# STREET AND ELECTRIC RAILWAYS

## Car Works

Washington, D. C. An illustrated description of the scheme of Gordon Campbell for furnishing maximum protection against damage to cars and injury to passengers from electrical causes. 600 w. *St Ry Jour*—April 21, 1906. No. 76173 C.

## Car Works.

Manchester Tramway Car Works. Brief illustrated description of a recently completed works in England. 1000 w. *Tram & Ry Wld*—Nov. 9, 1905. No. 73491 B.

## Chicago.

The Capacity of Surface Loops for Traffic as Influenced by the Intersecting Lines in the Downtown District of Chicago. W. A. Blanck. Report of an investigation showing that it is impossible to operate more cars on the loop under consideration with the present schedule of speed. 1600 w. *St Ry Jour*—April 14, 1906. No. 76065 C.

The Status of the Chicago Traction Problem. Louis Albert Lamb. Discusses the "99-years" claims of the Chicago street railways, and the result of the decision of the United States supreme court. 3300 w. *Elec Ry Rev*—July, 1906. No. 77966.

Superelevation of Tracks and Bridges—Metropolitan West Side Elevated Railway. Describes the raising of these tracks, made necessary by the elevation of railway tracks, which are crossed by this elevated road. Ills. 1100 w. *Ry Age*—Sept. 14, 1906. No. 79196.

## Chicago Subway.

The Proposed "Inner Circle" System of Chicago Subway Terminals. Arthur S. Robinson. An explanation of this scheme for the terminals of the Chicago subway. Ills. Discussion. Also followed by a letter from B. J. Arnold, with illustrations and descriptions of the systems he proposed. 16000 w. *Jour W Soc of Engrs*—Oct., 1906. No. 80007 D.

## Columbus, Ohio.

The Electric Railway Systems of Columbus. Reviews features of the Columbus Railway & Light Company. Ills. 4000 w. *St Ry Jour*—Oct. 13, 1906. (Convention Sec.). No. 79814 C.

## Commercial Success.

Considerations Affecting the Commercial Success of Electric Railway Undertakings. H. M. Hobart. A study of the factors affecting the commercial success of an electric railway system, with a comparison of two plans of operation. 2000 w. *Tram & Ry Wld*—Aug. 9, 1906. No. 78671 B.

## Construction.

Construction Work on the Rochester, Syracuse and Eastern Railroad. Explains the plan of construction of a road designed ultimately to furnish a double-track, high-speed, interurban electric road between Syracuse and Rochester. Ills. 3800 w. *St Ry Jour*—Dec. 16, 1905. No. 73790 C.

Construction Work on the Inter-Urban Railway, Des Moines, Iowa. Illustrates and describes the main features of a line built in conformity with steam-road practice. 2800 w. *St Ry Jour*—Aug. 25, 1906. No. 78801 C.

The Construction Work of the Elgin-Belvidere Electric Railway. Describes the more important points in the construction work of a high order, nearing completion in Illinois. Ills. 4000 w. *Elec Ry Rev*—Aug., 1906. No. 78612.

## Costs.

Cost of Electric Railway Power Production and Transmission in the State of Indiana. Albert S. Richey. Considers the average costs per unit of power on the Indiana interurban roads. 2500 w. *Jour Worcester Poly Inst*—March, 1906. No. 75614 C.

## Depot.

Burnley Tramways Depot. Henry Mozley. Particulars and illustrations of the Queens' Gate depot and general offices which have recently been erected, equipped and placed in operation. 2000 w. *Tram & Ry Wld*—Nov. 9, 1905. No. 73490 B.

## Depreciation.

Depreciation and Renewals Funds in Relation to Tramways Undertakings. G. W. Holford. Read before the Munic. Tram. Assn. Gives a tabulated statement showing the provision made by tramway undertakings with regard to a depreciation and renewals fund, considering rolling-stock, buildings, overhead equipment, and permanent way. 2500 w. *Elec Engr, Lond*—Sept. 28, 1906. No. 79686 A.

## Developments.

Electric Railway Developments. A general review of the recent great developments, with remarks on the future outlook. 2200 w. *Sci Am Sup*—Oct. 13, 1906. No. 79757.

## Direct Current.

A New and Higher Standard of D. C. Operation. Frank J. Sprague. The New York Central-New Haven Situation. Charles A. Mudge. Two letters on heavy electric railway work, with editorial discussion of them. 3000 w. *St Ry Jour*—Dec. 23, 1905. No. 74003 C.

## STREET AND ELECTRIC RAILWAYS

### Drainage

#### Drainage.

Drainage of the Interborough Rapid Transit Railroad Under the Harlem River. An illustrated article explaining the drainage and pumping system adopted, and the precautions taken to meet possible conditions in the two tubes under the Harlem River. 1000 w. Stevens Ind—Oct., 1905. No. 73931 D.

#### Earnings.

An Aggregate of Electric Railway Earnings. Abstract of an article in the *Commercial and Financial Chronicle*, giving as far as possible a total of the gross and net earnings of all important street and electric railways in the United States. 1200 w. R R Gaz—May 4, 1906. No. 76494.

#### Electric Locomotives.

See Railway Engineering, Motive Power and Equipment.

#### Electrification.

Technical Considerations in Electric Railway Engineering. F. W. Carter. Read before the Inst. of Elec. Engrs. (Abstract.) Also discussion. Discusses the question of the electrification of steam railways, its problems and the systems, their advantages and disadvantages. 10000 w. Elect'n, Lond—Jan. 6, Feb. 2, 1906. Serial. 2 parts. No. 74987 each A.

The Construction of the Rochester, Syracuse and Eastern Railway. Illustrated description of the construction of a road designed for heavy traffic. 3500 w. Eng Rec—March 3, 1906. No. 75407.

Development of Heavy Electric Traction. Discusses the subject as applicable to suburban service, favoring single-phase traction not only for long-distance lines, but for heavy suburban traffic. 1500 w. Elec Rev, Lond—Nov. 17, 1905. No. 73456 A.

Electric Traction. (Question VIII, 7th Session.) Victor Tremontani. Appendices to the report No. 4. Deals with accumulators, continuous current motors, three-phase current motors, monophase current motors, etc. 22300 w. 6 tables and Ills. Bul Int Ry Cong—Oct., 1905. No. 73404 F.

Heavy Electric Railroading. Bela Valatin. A comparison of the direct current, the single-phase, and the three-phase systems, particularly for installations to be used for moving heavy train units, and where electricity is to replace the steam locomotive. 3000 w. Elec Wld & Engr—Nov. 18, 1905. No. 73245.

The Tests of the Electric Railway Commission of the Louisiana Purchase

### Electrification

Exposition of 1904. Editorial review of the report of this commission. 4700 w. Engng—Aug. 17, 1906. No. 78853 A.

Electric Railway Engineering. F. E. Wynne. The first of a series of articles based on a course of lectures delivered by Mr. Clarence Renshaw dealing with the general principles relating to the operation of cars or trains. 3300 w. Elec Jour—Jan., 1906. Serial. 1st part. No. 74536.

Technical Considerations in Electric Railway Engineering. F. W. Carter. Deals in a general way with the technical side of the electrification problem, giving details of the methods employed in investigating the engineering features of the electrical system. 12300 w. Inst of Elec Engrs—Jan. 25, 1906. No. 74880 D.

The Railway in 1905. Dr. Louis Bell. A review of the year, noting the progress, the most important issue being the advance toward alternating current traction. 1800 w. Elec. Rev., N. Y.—Jan. 13, 1906. No. 74429.

The New York, Westchester & Boston Railway. Information concerning a four-track suburban electric line under construction on a right-of-way 100 ft. wide. Ills. 3000 w. Eng Rec—Dec. 2, 1905. No. 73570.

The Power Transmission Line and Third-Rail System of the Long Island Railroad. W. N. Smith. Begins an illustrated detailed description of this high-tension electric line. 9500 w. St Ry Jour—June 9, 1906. Serial. 1st part. No. 77200 C.

The Power Transmission Line, and Third Rail System of the Long Island Railroad. W. N. Smith. Illustrated detailed description. 6800 w. Elec Rev, N Y—June 9, 1906. No. 77195.

The Rotary Converter Substations of the Long Island Railroad. W. N. Smith. Illustrates and describes the general scheme of power distribution to the several lines through rotary-converter substations. 11400 w. St Ry Jour—June 23, 1906. No. 77445 C.

Transmission and Distribution System, Long Island R. R. Illustrates and describes in detail the more important structural features of the transmission and distribution system. 4500 w. Eng News—June 14, 1906. No. 77433.

Electrification of the Long Island Railroad. S. D. V. Burr. Map and illustrated description of the extensive system of electrification recently completed. 2500 w. Ir Age—Nov. 2, 1905. No. 72935.

# STREET AND ELECTRIC RAILWAYS

## Electrification

The Electrification of the Long Island Railroad. An illustrated description of this important electrification of a steam road, and the complicated service. 4000 w. Eng Rec—Nov. 4, 1905. No. 73058.

The Electrification of the Long Island Railroad. Illustrates and describes the main features of this important installation. 3800 w. St Ry Jour—Nov. 4, 1905. No. 73024 C.

The Installation of Electric Traction on the Long Island R. R. An illustrated article giving a statement of the work thus far done. 4000 w. Eng News—Nov. 2, 1905. No. 72954.

Electrification of the New York Suburban District of the New York Central & Hudson River Railroad. Illustrated descriptions of the power stations at Yonkers and at Port Morris, and of a typical sub-station, and their equipment and operation. 3800 w. Elec Rev, N Y—Nov. 11, 1905. No. 73113.

Improvements of the New York Central & Hudson River Within the Electric Zone. G. R. Wadsworth and J. C. Irwin. The present article gives an illustrated description of the electrical equipment. 5000 w. R R Gaz—Vol. XXXIX. No. 20. No. 73226.

Improvements of the New York Central and Hudson River Within the Electric Zone. G. R. Wadsworth. This article concludes a series, and describes and illustrates the new terminal building which will be erected on the site of the Grand Central Station. 1300 w. R R Gaz—Vol XXXIX. No. 21. No. 73433.

New York Central Electrification. Illustrates and describes the improvements which are in progress at the Forty-second Street terminal in New York City, to accommodate electric trains, and also the transmission system and sub-stations. 4200 w. St Ry Jour—Nov. 18, 1905. No. 73235 C.

Power Stations of the Electric Zone of the New York Central & Hudson River Railroad. Illustrates and describes the stations at Yonkers and Port Morris, with a typical sub-station and its equipment. 4000 w. St Ry Jour—Nov. 11, 1905. No. 73119 C.

First Electrical Operation on the West Shore Railroad. Illustrates and describes the section between Frankfort and Herkimer, 3.17 miles long, used by steam trains of the West Shore R. R., and also by electric cars of the Utica & Mohawk Valley Ry. 1000 w. St Ry Jour—Dec. 16, 1905. No. 73792 C.

## Evolution

The Electrification of the New York Central's Terminal Lines. An illustrated article summarizing the important work of electrifying the terminal lines of this railway. 6500 w. Sci Am Sup—Dec. 9, 1905. No. 73633.

See Railway Engng., Motive Power.

### Elevated.

The Market Street Elevated Railway, Philadelphia. An illustrated detailed description of the construction work. 2800 w. Eng Rec—Aug. 11, 1906. No. 78501.

### Elevated Railroad.

See Civil Engineering, Construction.

### Elevated Railway.

A Proposed Elevated Railway of 1827. Illustrates an elevated double track railway shown in an old pamphlet issued in 1827 by John Langdon Sullivan, giving the advantages claimed. 1000 w. Eng News—July 19, 1906. No. 78069.

Elevated Railways and their Bearing on Heavy Electric Traction. H. M. Brinckerhoff. Read before the Am. St. & Int. Ry. Engng. Assn. Presents features in elevated electric railway operation that may have a bearing on the "heavy traction problem." 3500 w. St Ry Jour—Oct. 20, 1906. No. 80032 C.

## England.

Blackpool, St. Anne's, and Lytham Tramways. Illustrated description of the construction of these electric tramways, which are remarkable for the "straight runs," freedom from gradients, and small number of curves. 2000 w. Tram & Ry Wld—June 7, 1906. No. 77400 B.

## English Practice.

English Electric Railway Practice. Particulars regarding features of recent permanent way and conductor rail work on roads changed from steam to electric traction. Ills. 2300 w. Prac Engr—Nov. 3, 1905. No. 73124 A.

## Equipments.

Electrical Equipments of the Columbus City and Interurban Railway Systems. An illustrated article describing in detail the equipments of the railway systems of this Ohio city. 3500 w. Elec Wld—Oct. 13, 1906. No. 79770.

## Europe.

Tramway Lines on the Continent. C. L. Durand. Brief illustrated descriptions of the Mediterranean Coast-line, Rouen line, and the Rome tramways. 4000 w. Elec Rev, N Y—Oct. 13, 1906. No. 79769.

## Evolution.

Some Notes on the Evolution of Electric Transportation. Theodore Stebbins.

# STREET AND ELECTRIC RAILWAYS

## Falkirk

A record of distinctions in construction and operation of electric traction in its various applications. 3000 w. *St Ry Jour*—Oct. 20, 1906. No. 80035 C.

## Falkirk.

Falkirk Electric Tramways. Illustrated detailed description of overhead construction, following standard tramway practice for a moderately dense service. 2000 w. *Tram & Ry Wld*—Dec. 7, 1905. No. 73972 B.

The Falkirk Tramways. Illustrated description of a new line in Scotland. 1200 w. *Elec Rev.*, Lond—Dec. 22, 1905. No. 74142 A.

## Fares.

The Canadian System of Collecting Fares. Includes I. Collecting and Handling Fares on the Toronto Railway, by R. T. Clark; II. Handling Fares on the Montreal Street Railway, by H. E. Smith; and Fare Collecting, by D. McDonald. Also editorial. Ills. 6000 w. *St Ry Jour*—Jan 27, 1906. No. 74722 C.

## Feeding.

Advantages and Disadvantages of Feeding Tramway Systems in Isolated Zones as Compared with Closed Networks. Abbreviated translation of a report by M. Piazzoli, on the replies received to questions sent out, presenting the advantages of the system of feeding by isolated zones. 3000 w. *Elect'n*, Lond—Oct. 19, 1906. No. 80133 A.

## Fire Hazard.

The Fire Hazard in Car Barns. Joseph B. Finnegan. Discusses the proper construction, the hazards due to repair work, heating and lighting, use of oils and grease, lamp filling, sand drying, defective wiring, &c. 2500 w. *St Ry Rev*—Dec. 15, 1905. No. 73777 C.

## Florida.

Electric Railway Improvements at Key West, Florida. Frederic H. Porter. Illustrated account of this road and the interesting problems due to climate and soil. 3000 w. *Elec Ry Rev*—Sept., 1906. 79206.

## Freight.

Freight-Handling by the Des Moines Interurban Railway Co. An illustrated account of an electric railway that has found hauling freight profitable. 3500 w. *Ry & Engng Rev*—Feb. 10, 1906. No. 74960.

Freight and Express. Reviews the latest methods for handling freight and express on interurban roads. Ills. 7000 w. *St Ry Jour*—Oct. 13, 1906. (Convention Sec.). No. 79821 C.

## High Speed

Interurban Freight and Express. Edward C. Spring. Read before the Am. St. & Int. Ry. Engng. Assn. Critical discussion of this branch of the interurban service. 2200 w. *St Ry Jour*—Oct. 20, 1906. No. 80033 C.

Methods of Handling Freight on the Dayton & Troy Electric Railway. An Explanation of the methods of a company which operates a 31-mile interurban electric line in Ohio. 2500 w. *Elec Ry Rev*—Oct., 1906. No. 79654.

Freight Handling Practice on Electric Railways. An illustrated article describing some of the methods of handling the business, and giving information of interest. 8000 w. *Ry & Engng Rev*—May 12, 1906. No. 76635.

## Freight Haulage.

Cost of Freight by Electric Haulage. George E. Walsh. Discusses the carrying of freight by interurban electric lines, giving reports from various lines. 2000 w. *Elec*, N Y—Dec. 6, 1905. No. 73547.

## Gasoline Cars.

The Gasoline Car for Interurban Service. F. W. Hild. Read at convention of the Iowa St. & Int. Ry. Assn. Investigates and compares the factors essential to the success of self-propelled cars, concluding that these cars will find a useful field quite distinct from that served by the electric system. Also editorial. 6500 w. *St Ry Jour*—May 5, 1906. No. 76532 C.

## Grade.

The Story of the Galveston Grade Raising—From the Street Railway Point of View. H. S. Cooper. An illustrated article describing grade raising under very adverse conditions. 4000 w. *St Ry Jour*—May 12, 1906. No. 76644 C.

## Halifax.

Some Notes on the Operation of the Halifax Electric Tramway Plant. Philip A. Freeman. Briefly describes the plant, the operating and care of the boilers, the engines, etc. 2500 w. *Power*—Oct., 1906. No. 79459 C.

## Hanger Bolts.

The Preservation of Hanger Bolts on Electric Tramways. Robert N. Tweedy. Gives an account of failure of insulated hanger bolts, and the remedy. 1100 w. *Elec Rev.*, Lond—Dec. 29, 1905. No. 74288 A.

## High Speed.

High Speed Electric Railroads. Henry G. Morris. Discusses some of the conditions governing steam and electric railway practice in the United States, and the present speed limitations; reviews facts



# STREET AND ELECTRIC RAILWAYS

## History

developed in the German experiments, and presents the "Motor cycle Railway" for consideration. 6800 w. Pro Engrs. Club of Phila—Jan. 1906. No. 74534 D.

## History.

A Quarter Century of Electrical Railway Engineering. Franz Koester. An illustrated review of the development of electric traction since 1879, showing the progress from the early experimental lines to the design of the modern heavy alternating-current locomotives. 2500 w. Engineering Magazine—March, 1906. No. 75166 B.

## Illinois.

The Illinois Traction System. Illustrated description of recent improvements and extensions in Central Illinois. 5800 w. St Ry Rev—Feb. 15. No. 75229 C.

## Improvements.

Improvements of the Brooklyn Rapid Transit Company. Illustrates and describes interesting work in connection with the reconstruction of this property. 1600 w. Ry Age—May 18, 1906. No. 76716.

Improvements and Operating Features of the Southwest Missouri Electric Railway. Describes the extensions and track work, the new line, new cars, etc., and the system of operation. 4000 w. St Ry Jour—July 21, 1906. No. 78072 C.

Improvements on the St. Louis and Suburban Railway. An illustrated article describing reconstruction and double tracking, the erection of a new substation, etc. 1500 w. St Ry Jour—June 30, 1906. No. 77728 C.

Extensions and Improvements on the Chicago & Milwaukee Electric Railroad. An illustrated article concerning the reconstruction, extensions and improvements on the various divisions of this road during the past year. 3000 w. St. Ry Jour—Jan. 20, 1906. No. 74469 C.

## Incline.

A Cable Incline Railway with Endless Cable. The Bernardit system adopted at Nancy, France, is illustrated and described. 1000 w. Eng News—July 12, 1906. No. 77926

## Incline Railways.

The New Inclines of the Sao Paulo Railway, Brazil. James Fforde. Illustrated descriptions of improvements to meet increase of traffic. Easier gradients, the adoption of the "endless rope," etc. 2400 w. Inst of Civ Engrs—No. 3614. No. 79517 N.

## Interurban.

A Desirable Car for Interurban Service. P. J. Mitten. Read before the Indiana

## Interurban

Elec. Ry. Assn. Gives the writer's views, and abstract of discussion. 3500 w. St Ry Jour—Dec. 23, 1905. No. 74004 C.

The Dayton & Muncie Electric Railway. Particulars in regard to this recently completed line, with illustrated detailed description of its stations, equipment, rolling-stock, &c. 3000 w. St Ry Jour—Dec. 2, 1905. No. 73519 C.

The Detroit, Flint & Saginaw Railway Co. Illustrated description of the territory served, roadway construction, new power house and equipment. Edward J. Hunt. 2500 w. St Ry Rev—Dec. 15, 1905. No. 73776 C.

The Toledo, Port Clinton & Lake Side Railway. Illustrated detailed description of a line which has opened up territory in northern Ohio, hitherto without adequate transportation facilities. 3700 w. St. Ry. Jour—Dec. 30, 1905. No. 74120 C.

Freight and Express Traffic on Interurban Railways. M. E. Graston. Read before the Indiana Elec. Ry. Assn. Discusses points in regard to increasing the business and handling the freight. Abstract of discussion. 2800 w. St Ry Rev—Nov. 15, 1905. No. 73212 C.

The Rochester, Syracuse & Eastern Railway. Illustrates and describes the construction of this electric line in New York state. The work is of special interest, as the territory traversed will be served in competition with the New York Central steam road. 3000 w. Ry & Engng Rev.—Feb. 10, 1906. No. 74961.

Operating Features of the Dayton & Troy Railway. An illustrated description of methods adopted on a successful short line in Ohio. 4400 w. St. Ry Jour—March 10, 1906. No. 75481.

Economic and Financial Phases of Interurban Railways. Guy Morrison Walker. Especially discussing the economic value of railways. 6000 w. Sib Jour of Engng—April, 1906. No. 76389 C.

Extensions and Improvements of the Terre Haute Traction & Light Company. An illustrated article describing new lines, features of the high-tension feeder system, and other improvements. 2000 w. St Ry Jour—April 28, 1906. No. 76410 C.

Some Considerations as to Safety in the Operation of Electric Interurban Railways. An editorial review of matters affecting their safe operation, especially dealing with the larger and more important lines. 3300 w. Eng News—June 7, 1906. No. 77244.

The Southern Michigan Railway. Illustrates and describes a new line of

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## Interurban

electric interurban railways 24 miles in length, connecting St. Joseph and Niles, Mich., and gives an account of present and projected lines. 1700 w. *Ry & Engng Rev*—June 2, 1906. No. 77086.

Interurban Train Testing Apparatus. Sydney W. Ashe. Illustrates and describes a new simple type of train testing set, and reports tests made on new rolling stock of the Brooklyn Rapid Transit Company. 2500 w. *St Ry Jour*—Sept. 8, 1906. No. 79042 C.

The Rehabilitation of the Philadelphia & West Chester Traction Company's Properties. An illustrated article giving interesting and valuable information in regard to modern interurban practice, and showing how a non-paying country trolley road was made a successful interurban property. 7000 w. *St Ry Jour*—Sept. 1, 1906. No. 78920 C.

A 1000-Volt Direct-Current Interurban Railway. Illustrates and describes interesting features of the railway in operation between Cologne and Bonn, along the bank of the Rhine. 1000 w. *Elec Engr, Lond*—Oct. 19, 1906. No. 80129 A.

The Groton & Stonington Street Railway. An illustrated description of a line from Groton, Conn., to Westerly, R. I., its construction, operation, etc. 3000 w. *St Ry Jour*—Oct. 6, 1906. No. 79637 C.

The Toledo and Chicago Interurban Railway. Illustrated detailed description of this new single-phase line for passenger and freight traffic. 1800 w. *Elec Ry Rev*—Oct., 1906. No. 79652.

Wemyss and District Tramways. An illustrated description of this short interurban line in Scotland, which includes sections of tramway and light railway, with an explanation of how the scheme was carried out. 2400 w. *Tram & Ry Wld*—Oct. 4, 1906. No. 79863 B.

## Lake Minnetonka.

The Development of Lake Minnetonka by the Twin City Rapid Transit Company. An illustrated account of the preparations to give ready access to different parts of this beautiful lake near Minneapolis. 2800 w. *St Ry Jour*—Sept. 8, 1906. No. 79040 C.

## Leeds.

The Tramway System of Leeds. Illustrated detailed description of its construction and operation; its history, etc. 13200 w. *Tram & Ry Wld*—Sept. 6, 1906. No. 79296 B.

## Lightning.

Lightning Protection. J. V. E. Titus. Read before the Ohio Int. Ry. Assn. Discusses features of lightning arresters and

## London

their methods of operation. 3500 w. *St Ry Rev*—Feb. 15, 1906. No. 75230 C.

## Line Construction.

New Material for Catenary Work. Illustrated description of a new method of construction now under trial, reporting tests. 1000 w. *St Ry Jour*—May 26, 1906. No. 76965 C.

## Lines.

Lines and Cables. Discusses high-tension transmission lines and overhead construction for interurban roads. 4200 w. *St Ry Jour*—Oct. 13, 1906. (Convention Sec.) No. 79819 C.

## Locomotive.

A Storage-Battery Locomotive. Illustrated description of a novel type of electric locomotive designed for service on the new drop level tube for London that is in course of construction. 700 w. *Sci Am*—Nov. 25, 1905. No. 73414.

Electric Locomotive (Ganz System) for the Valtellina Line, Italy. Illustrated detailed description of the new locomotives and information of tests. 2500 w. *Ry. Age*—Dec. 29, 1905. No. 74097.

20,000-Volt Single-Phase Locomotive for Sweden. Illustration and description of a locomotive supplied by the Siemens-Schuckert Co., weighing 36 tons, and intended to haul goods trains at speeds up to 40 miles per hour. 1400 w. *Elect'n, Lond*—Jan. 5, 1906. No. 74406 A.

The Electric Locomotives for the Simplon Tunnel (Les Locomotives Electriques du Tunnel du Simplon). Describing and illustrating the new three-phase locomotives being built for the tunnel service by Brown, Boveri & Co. 3500 w. 1 plate. *Bull Tech de la Suisse Romande*—May 25, 1906. No. 77640 D.

The New Simplon Three-Phase Locomotives. Frank C. Perkins. Diagram and photographs with description of interesting details. 1000 w. *Elec Engr, Lond*—June 8, 1906. No. 77177 A.

## London.

Baker Street and Waterloo Railway. Illustrated detailed description of this recently completed tube railway, its equipment, rolling stock, traffic, prospects, finances, &c. 11000 w. *Tram & Ry Wld*—March 8, 1906. No. 75634 B.

The London County Council Tramway Power Station at Greenwich. Illustrated detailed description of this large modern generating station in course of erection. 2300 w. *Engng*—March 2, 1906. Serial 1st part. No. 75508 A.

London Tube Railways Permanent Way. Drawings showing in detail the system in the Baker Street and Water-

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## London Depot

loo Railway, with explanatory notes. 800 w. R R Gaz—April 20, 1906. No. 76156.

Recent Extensions of the London United Tramways. Illustrated description of the recently opened Surrey extensions, which are the first tramways to cross a Thames bridge. 2200 w. Elec Rev, Lond—April 6, 1906. No. 76073 A.

First London Tramway across the Thames. Illustrated description of the Vauxhall-Victoria tramway. 2200 w. Tram & Ry Wld—May 19, 1906. No. 76927 B.

## London Depot.

New Cross Depot of London County Council Tramways. Illustrates and describes a large car shed and its equipment for handling cars on a conduit system. Also repair shops and other features of interest. 2500 w. Tram & Ry Wld—Aug. 9, 1906. No. 78670 B.

## London Subway.

The First London Tramway Subway. Illustrated description of the line from the Strand to Islington. Map and sections, with description of the steel cars for the service. 2000 w. Tram & Ry Wld—Jan. 11, 1906. No. 74741 A.

## Loops.

Traffic Problems Upon Loops and Stub Tracks. Howard S. Knowlton. Presents equations covering the general cases most commonly encountered. 2700 w. St Ry Rev—Nov. 15, 1905. No. 73211 C.

## Losses.

Energy Losses on Tramways. Gives figures derived from undertakings in England, with general remarks. 1500 w. Elec Rev, Lond—Jan. 12, 1906. No. 74515 A.

## Main Lines.

Alternating Current Electric System for Heavy Railway Service. B. G. Lamme. Discusses the development in the application of electricity to heavy service, and describes the New Haven single-phase equipment. Discussion follows. Ills. 34000 w. Pro N Y RR Club—March 16, 1906. No. 76091.

Electric Traction for Trunk Lines. Extracts from a report made by K de Kando, to Ganz & Co., on impressions received on his recent trip to America. 3500 w. R R Gaz—April 20, 1906. Serial. 1st part. No. 76155.

Electric Traction on Main Line Railways in Europe. Philip Dawson. A discussion of the electrification of main lines, explaining conditions, comparing the systems of operations available, describing details of equipment, and giving

## Motor Car

much information. Ills. 9500 w. St Ry Jour—April 7, 1906. No. 75989 C.

Electrification of the West Shore Railroad Between Utica and Syracuse. Maps and description of the changes being made in this section, and the service to be rendered. Also editorial. 2500 w. St Ry Jour—May 19, 1906. No. 76726 C.

## Manila.

The Manila Electric Railway. An illustrated article describing the modern public lighting and transportation system installed, and giving information of interest in regard to its construction and the native labor employed. 3000 w. Ry & Engng Rev—March 17, 1906. No. 75586.

## Milwaukee.

Commerce Street Power Plant of the Milwaukee Electric Railway and Light Company. Illustrated description of the plant which supplies practically all the current required to operate the extensive street and interurban railway system. 5500 w. St Ry Jour—July 28, 1906. No. 78278 C.

The New Public Service Building of the Milwaukee Electric Railway and Light Company. Illustrated detailed description of a building which combines a terminal station for interurban service, and an office building devoted to the needs of the company. 6000 w. St Ry Jour—July 14, 1906. No. 77932 C.

## Missouri.

The St. Francois County Electric Railway. An illustrated description of a very successful line, explaining its peculiar location, and the reasons for its exceptional earning capacity. 3000 w. St Ry Jour—May 26, 1906. No. 76963 C.

## Mono-Rail.

The Wetterhorn Electric Aerial Mono-Rail. A departure in mountain railway construction is illustrated and described. A stout wire cable forms the overhead mono-rail from which is suspended the running gear of the car body. 1000 w. Engr, Lond—Nov. 10, 1905. No. 73299 A.

The Behr Monorail System. Charles Edmund Tingley. Illustrated description of this system, which is under consideration for a line from the Interborough terminus at Flatbush and Atlantic avenues, Brooklyn, to Coney Island. 1600 w. Elec N Y—March 7, 1906. No. 75380.

## Motor Car.

The Delaware & Hudson Gasoline-Electric Car. An illustration, with account of the trial run of this novel car, which was quite successful. 1500 w. St Ry Jour—Feb. 10, 1906. No. 74926 C.

# STREET AND ELECTRIC RAILWAYS

## Motors

### Motors.

Distribution of Motors on Trucks. Cale Gough. Gives an outline of the methods by which the problem can be solved for any given case. 4000 w. St Ry Jour—Oct. 16, 1906. No. 79639 C.

### Mountain Road.

The Brunnen - Morschach Electric Mountain Railway (Die Elektrische Bergbahn Brunnen Morschach Schweiz). Wolfgang Adolf Müller. The road runs from Brunnen on the lake of Lucerne to Morschach, 258 metres above. It is a rack railroad, with three-phase electric traction; details of the line and locomotives are given. 3500 w. Zeitschr d Ver Deutscher Ing—May 19, 1906. No. 77601 D.

### Municipal Ownership.

See Industrial Economy.

### N. Y. Central R. R.

Port Morris Power Station of the New York Central & Hudson River Railroad. Illustrated detailed description of this station and its equipment. It is now ready to operate the initial electric zone of the N. Y. C. & H. R. R. Co. 3000 w. Elec Wld—Sept. 29, 1906. No. 79544.

Cooling the New York Subway. Diagrams and descriptions of the new ventilating system and the experimental cooling plant. Ills. 2000 w. Elec Rev, N Y—Oct. 20, 1906. No. 79880.

The Sanitary Condition of the New York Rapid Transit Subway. Gives a reprint of the preliminary report of Dr. George A. Soper, with editorial comment. 2800 w. Eng News—Nov. 9, 1905. No. 73085.

### New Zealand.

Municipal Electric Railways at Wellington, New Zealand. Frank C. Perkins. Illustrated description of a railway power plant and electric railway system operated by the municipality which has recently been put in operation. 2500 w. Elec Rev, N Y—Aug. 18, 1906. No. 78610.

### Ohio Valley.

The New Ohio Valley Electric Railway Properties. Describes this valley and gives an illustrated detailed description of the new line to be built from Beaver, Pa., to Steubenville, Ohio; a distance of nearly 50 miles. 5000 w. St Ry Jour—Sept. 1, 1906. No. 78921 C.

### Operation.

Electric Railway Engineering. William Cooper. Discusses the control of cars and trains operated by direct current. 3800 w. Elec Jour—March, 1906. No. 75627.

## Parallel Mileage

A Study of Electric-Railway Operating Cost and Revenue. H. S. Knowlton. A discussion of the applications of the unit basis method of administration, with examples from representative roads. 2500 w. Engineering Magazine—July, 1906. No. 77686 B.

Operating Details of the Lackawanna & Wyoming Valley Railroad. An illustrated report of this high-speed third-rail line, its method of operating, traffic, and related matters of interest. 4800 w. St Ry Jour—Aug. 4, 1906. No. 78441 C.

Some Operating Features of the Toledo & Indiana. Reports new features introduced in the operation of this line which at present extends from Toledo to Bryan, Ohio. Ills. 2500 w. St Ry Jour—Aug. 4, 1906. No. 78442 C.

Electric Railways in Sparsely Settled Communities. E. P. Roberts. Read before the Am. St. & Int. Ry. Engng. Assn. Considers local conditions and peculiarities that affect earnings, giving statistics and discussing their value, and many matters having a bearing on this subject. 12000 w. St Ry Jour—Oct. 20, 1906. No. 80034 C.

Municipal Operation of Tramways: Some Points of a Committee's Policy. R. A. Smithson. Discusses questions coming before tramway committees for decision. Also brief general discussion. 3500 w. Elect'n, Lond—Sept. 28, 1906. No. 79699 A.

Schedules, Limited Services, Speeds, Fares, Despatching and Miscellaneous Matters. Outlines the latest practice. Ills. 11000 w. St Ry Jour—Oct. 13, 1906. (Convention Sec.) No. 79820 C.

### Overhead.

Continuous vs. Sectionalized Overhead Systems. Prof. G. Rasch. Abstract of a paper at the Milan Convention. Discusses the advantages and disadvantages of the two systems. 1700 w. St Ry Jour—Sept. 22, 1906. No. 79409 C.

### Overhead Equipment.

Notes on the Construction and Maintenance of Overhead Equipment. Robert N. Tweedy and H. Dudgeon. Abstract of a paper read before the Birmingham Loc. Sec. of the Inst. of Elec. Engrs. Discusses the variation in cost, the poles, bases, wires, insulators, &c., in the present number. 4500 w. Elect'n, Lond—Feb. 16, 1906. Serial. 1st part. No. 75276 A.

### Parallel Mileage.

Parallel Mileage of Electric and Steam Railroads. Gives maps of roads in Ohio, Indiana, Illinois, and Michigan principally where high-speed interurban lines paral-

## STREET AND ELECTRIC RAILWAYS

### Paris

1el steam lines, and discusses the conditions. 4000 w. Ry & Engng Rev—Sept. 8, 1906. No. 79076.

### Paris.

The Crossing of the Seine by the Metropolitan Railway (Traversée de la Seine par la Ligne Métropolitaine). A. Dumas. Describing the construction of the tunnel under the Seine for the North and South transversal of the Paris Metropolitan railway. 3000 w. 1 plate. Génie Civil—Dec. 2, 1905. No. 73813 D.

The North-South Underground Railway in Paris (Le Chemin-de-fer Electrique Souterrain Nord-Sud de Paris). A. Dumas. A description of the new section of the Paris Metropolitan, connecting the Montparnasse quarter with Montmartre. 3500 w. 1 plate. Génie Civil—April 28, 1906. No. 77608 D.

The Paris Metropolitan Railway (Le Métropolitain de Paris). A. Dumas. A review of the projected extensions of the underground railway in Paris, together with a description of the extensive works now under construction, with maps and profiles. 10000 w. 5 plates. Génie Civil—April 21, 1906. No. 77606 D.

### Permanent Way.

The "Romapac" System of Tramway Permanent Way. Illustrates and describes a system in which a detachable head or wearing surface is fitted to the rail, explaining its advantages. 1800 w. Engng—Feb. 9, 1906. No. 75073 A.

### Philadelphia.

The Electric Tramways of Philadelphia (Les Tramways Electriques de Philadelphie). P. Ayné. An illustrated description of the electric street and suburban railways of Philadelphia, from a French point of view. 3000 w. Génie Civil—Nov. 25, 1905. No. 73811 D.

### Philadelphia Subway.

The Lighting System and overhead Construction of the Philadelphia Subway. An illustrated article giving particulars of this work. 800 w. St. Ry. Jour—Dec. 30, 1905. No. 74121 C.

### Pittsburg.

The Brunot's Island Power House of the Pittsburg Railways Co. Illustrated detailed description of a large power station and its equipment. 3000 w. Ry & Eng. Rev—Jan. 13, 1906. No. 74377.

### Power.

Power Supply to Tramway Systems. S. J. Watson. Read before the Incor. Munic. Elec. Assn., London. The subject applies only to small or medium-sized districts operating from 6 to 30 cars. Discusses whether the supply can

be best given by storage batteries and a reversible booster, or run directly on the traction load. 5000 w. Elect'n, Lond—July 6, 1906. No. 77973 A.

### Power House.

See Electrical Engineering, Generating Stations.

### Power Plant.

The Commerce Street Power Plant of the Milwaukee Electric Railway & Light Company. Illustrated description of the changes which have more than doubled the capacity of the plant. 2800 w. Elec Ry Rev—July, 1906. No. 77965.

Quincy Point Power Plant of the Old Colony Street Railway Co. Howard S. Knowlton. Illustrated description of one of the largest and most interesting power plants in New England. The generating equipment consists of five 2,000 K. W. Curtis turbo-alternators. 2500 w. Engr. U S A—Jan. 15, 1906. No. 74476 C.

### Preliminaries.

Electric Railway Engineering Preliminaries. Sydney W. Ashe. Discusses the relation of trackage and traffic to population, and other matters to be considered in planning a new system of electric railways. 2500 w. Elec Rev, N Y—June 2, 1906. No. 77111.

### Puget Sound.

The Puget Sound Electric Railway. An illustrated description of its physical features, equipment, passenger and freight traffic, operating system and accounting. 4500 w. St Ry Rev—March 15, 1906. No. 75639 C.

The Puget Sound Electric Railway. Map and illustrated description of a third-rail line 36.5 miles long, connecting Seattle and Tacoma. 1800 w. Ry Age—May 11, 1906. No. 76634.

### Rails.

Rail Corrugation: A Review! A résumé of the opinions expressed as to the causes of the phenomenon of the longitudinal corrugations. 2500 w. Elec Rev, Lond—July 27, 1906. Serial. 1st part. No. 78467 A.

### Rail Joints.

Rail Joints for Electric Street Railways (Die Stossverbindung der Rillenschienen Elektrischer Strassenbahnen). Max Buchwald. Illustrations of various forms of German rail joints, and of a portable milling machine for finishing the surfaces. 3000 w. Elektrotech Zeitschr—June 28, 1906. No. 78165 B.

### Railway Motors.

See Electrical Engineering, Motors.

### Railway Test.

Test of the Railway System of the

# STREET AND ELECTRIC RAILWAYS

## Rapid Transit

Scioto Valley Traction Company. F. C. Caldwell. The principal object of the test was to obtain a statement of the distribution of the power consumption and losses throughout the system during a normal day's run. 4800 w. St Ry Rev—Nov. 15, 1905. No. 73210 C.

## Rapid Transit.

Rapid Transit in Chicago. A report submitted by Bion J. Arnold to the Committee on Local Transportation of the Chicago City Council, July 2, 1906. Recommendations as to what to do at present. Map. 2800 w. R R Gaz—July 13, 1906. No. 77951.

The 60,000-Volt Sub-Station and Transmission Line of the Syracuse Rapid Transit Company. An account of the transmitting of a 60,000-volt current generated at Niagara Falls, 165 miles to Syracuse, to be utilized for operating the traction system of the city. 4500 w. St Ry Jour—July 14, 1906. No. 77933 C.

The New Philadelphia Rapid Transit Subway. J. A. Stewart. Describes the completed section recently opened, and features of the construction. Ills. 1200 w. Munic Engng—March, 1906. No. 75338 C.

## Reconstruction.

The Reconstruction of the Topeka Railway. An account of a thorough reconstruction of the physical equipment, and reorganization of operating methods which brought such an increase in net earnings as made the returns on the investment entirely satisfactory. Ills. 2700 w. St Ry Jour—Nov. 11, 1905. No. 73120 C.

Extension and Improvements of the Chicago & Milwaukee Electric Railroad Co. An illustrated account of the work accomplished during the last year, in the reconstruction of this property. 4500 w. St Ry Rev—Jan. 15, 1906. No. 74496 C.

The Reconstruction of the Clinton Street Railway System, Clinton, Iowa. The reconstruction work amounted to a complete rebuilding of the system, which is now considered a model for small cities. An illustrated description is given. 2500 w. St Ry Jour—Aug. 4, 1906. No. 78443 C.

## Regulations.

Safety Regulations for Street and Electric Railways (Sicherheitsvorschriften für Elektrische Strassenbahnen und Strassenbahnähnliche Kleinbahnen). Report of the committee of *Verband Deutscher Elektrotechniker*. 7500 w. Elektrotech Zeitschr—Aug. 23, 1906. No. 79354 B.

## Report.

Report of Electric Railway Test Commission. Review by Louis Bell, of the report of the Commission which served at the St. Louis Exposition. 2500 w. St Ry Jour—June 2, 1906. Serial. 1st part. No. 77068 C.

## Rolling Stock.

Experimental Rolling Stock for the Blankenese and Ohlsdorf Suburban Railway. Gustav Dietl. Translated from *Elektrische Bahnen und Betriebe*. Illustrates and describes the cars built for these lines near Hamburg, which are operated by single-phase alternating-current of a frequency of 25 cycles per second and a mean voltage of 6,000. 4500 w. Tram & Ry Wld—Feb. 8, 1906. No. 75294 B.

Latest Practice in Rolling Stock Design and Equipment. Reviews interurban practice in car design, seats, trucks, wheels, lubrication, brakes, brake shoes, motors, and controllers, trolley wheels, signal lights, fenders and pilots, sanders, signs, and other rolling stock matters. Ills. 1400 w. St Ry Jour—Oct. 13, 1906. (Convention Sec.) No. 79817 C.

## Sand.

Drying Sand for Sanding Rails in the Borough of Manhattan. W. Boardman Reed. Explains the conditions which cause "bad" rails in the city, and the effects of coarse sand on the wheels and describes the screening and drying of the sharp fine sand used. Ills. 2800 w. St Ry Jour—March 31, 1906. No. 75874 C.

## Sanding.

Sanding Devices for Tramcars. From an article by Herr Kosch, in *Elektrische Bahnen und Betriebe*, describing and criticising a number of these arrangements. Ills. 800 w. Elec Engr, Lond—Aug. 17, 1906. No. 78841 A.

## San Francisco.

Street Railway Situation in San Francisco. An illustrated article explaining some changes proposed in reconstructing the lines destroyed by the earthquake and fire. 1800 w. St Ry Jour—May 19, 1906. No. 76727 C.

## Scioto Valley.

Some Practices on the Scioto Valley Traction System. Reviews some of the operating methods of this interurban road. Ills. 10500 w. St Ry Jour—Oct. 13, 1906. (Convention Sec.) No. 79815 C.

## Shops.

New Shops of the Oakland Traction Consolidated and Key Route Systems. Illustrated detailed description of new shops.

## Shops

# STREET AND ELECTRIC RAILWAYS

## Signaling

in California and their equipment. 6000 w. St Ry Jour—Feb. 3, 1906. No. 74849 C.

Repair Shop Practices of the Toronto Railway. Illustrated description of these shops and some of the important economies and improvements recently introduced. 3000 w. St Ry Jour—Feb. 10, 1906. No. 74923 C.

Repair Shop Practices of the Montreal Street Railway. An illustrated article dealing with practices and devices in shops having a wider range of work than is usually customary. 2800 w. St Ry Jour—Jan. 27, 1906. No. 74723 C.

The New Car House and Remodeled Shops of the International Railway Company, Buffalo, N. Y. Illustrates and describes recent improvements in the car-house and shop facilities at the Cold Springs depot. 4500 w. St Ry Jour—July 7, 1906. No. 77847 C.

New Repair Shops of the Omaha & Council Bluffs Street Railway Company. Illustrated description of the construction, and the operating methods of large shops. 2200 w. Elec Ry Rev—Sept., 1906. No. 79207.

## Signaling.

Automatic Signaling on the District Railway. A short description of the system and its working. 1000 w. Engr, Lond. Jan. 19, 1906. No. 74754 A.

Automatic Train Stopping. Illustrates and describes devices used on the Boston Elevated, N. Y. Subway, and other lines. 2300 w. Ry & Loc Engng—Feb., 1906. No. 74854 C.

Automatic Signalling on the Underground Railways of London. Illustrated description of the system installed on the District Railway. The main feature is that currents extraneous to the signal system cannot affect the apparatus so as to cause a false indication of safety. 7500 w. Engng—May 25, 1906. Serial. 1st part. No. 77138 A.

Some Recent Block Signal Systems for Electric Railways. Gives particulars of some systems which have been put in service, with diagrams. 3500 w. Eng News—July 19, 1906. No. 78070.

## Simplon

Electric Traction on the Simplon Railway. Dr. Alfred Gradenwitz. Information concerning the arrangements being made for the trial runs permitting a comparison between steam traction and electric service. 1000 w. Sci Am—April 7, 1906. No. 75926.

Electric Traction in the Simplon Tunnel (La Traction Electrique dans le Tunnel du Simplon). S. Herzog. With

## Single-Phase

views of the terminal stations at Brig and Iselle, and a description of the wiring and the locomotives; showing how the difficulties of insulation have been overcome. 2000 w. 1 plate. Génie Civil—Sept. 15, 1906. No. 79322 D.

Electrical Equipment of the Simplon Tunnel. Dr. Alfred Gradenwitz. An illustrated article describing how plants formerly supplying power for use in building the tunnel have been adopted for feeding the three-phase trolley system. 1500 w. Elec Ry Rev—Oct., 1906. No. 79655.

Electric Traction in the Simplon Tunnel. Illustrations and interesting particulars of the electrical installation which is now in operation. 3000 w. Elect'n, Lond—Sept. 28, 1906. No. 79697 A.

## Singapore.

A British Enterprise in the Far East. An illustrated description of the electric tramways in Singapore. 2200 w. Tram & Ry Wld—Dec. 7, 1905. No. 73971 B.

Electric Tramways in Singapore. Illustrated description of the recently completed electric railway system. Among its special features is the employment of narrow gage and of welded rails. 1800 w. St Ry Jour—Jan 27, 1906. No. 74724 C.

## Single-Phase.

Single-Phase Electric Traction (La Traction Electrique par Courant Alternatif Simple). Describing the Auvert-Ferrand transformer for use directly upon the car. 1500 w. Génie Civil—Nov. 11, 1905. No. 73320 D.

Tests of Interurban Single-Phase Equipments. Graham Bright. Describes methods of testing, reporting tests taken recently. 1500 w. Elec Jour—Nov., 1905. No. 73406.

A Short Single-Phase Railway on Long Island. Illustrated description of a road that has been in service for the past two months to convey passengers from Sea Cliff and Glen Cove stations to neighboring steamboat landings on Long Island Sound. 2000 w. St Ry Jour—Dec. 16, 1905. No. 73791 C.

Single-Phase Motors for Tramways (Einphasen - Wechselstrom - Betrieb auf Strassenbahnen). E. C. Zehme. A detailed description of the system under test in Paris by the French Thomson-Houston Company. 2000 w. Elektrotech Zeitschr—Dec. 7, 1905. No. 73857 B.

Single Phase v. Continuous Current for Traction Purposes. Editorial discussion of the merits of a well-designed single-phase system as compared with the

## STREET AND ELECTRIC RAILWAYS

### Single-Phase

continuous current. 2000 w. Engng—Nov. 24, 1905. No. 73602 A.

The Single Phase Alternating and the Direct-Current Systems. A letter from Mr. George Westinghouse setting forth the advantages of the single-phase alternating system, and giving also letters to President Newman of the N. Y. C. R. R. from Mr. Westinghouse, and to Mr. E. M. Herr, from B. G. Lamine. 5200 w. R R Gaz—Vol. XXXIX., No. 25. No. 74011.

Single-Phase Railway in Paris. P. Lethuile. Brief illustrated description of single-phase traction with motors of the Latour type. 500 w. St Ry Jour—Feb. 10, 1906. No. 74925 C.

Electrical Equipment for the Sarnia Tunnel, Grand Trunk Railway. Illustrated description of an electrical installation to operate freight and passenger trains through the tunnel that connects the American and Canadian divisions, using the single-phase alternating current system. 2800 w. Ry. & Engng Rev.—Jan. 13, 1906. No. 74374.

Single-Phase Electric Locomotives and Power Equipment of the St. Clair Tunnel Company. Illustrated detailed description, with general information. 2300 w. R R Gaz—Vol. XL. No. 3. No. 74455.

Comparison Between Single-Phase and Three-Phase Equipment for the Sarnia Tunnel. C. L. de Muralt. Compares the advantages of the two alternating-current systems, especially considering the three-phase system. 5000 w. St Ry Jour—Feb. 17, 1906. No. 75031 C.

Gas Power in the Operation of High Speed Interurban Railways. J. R. Bibbins. Briefly describes this single-phase high-voltage system of the Warren & Jamestown railway, and the exclusive use of gas power. Ills. 5800 w. Eng Rec—Feb. 17, 1906. No. 75052.

Single-Phase Alternating Current Railway Work. Lionel Calisch. Considers the various single-phase motors which can be used for traction purposes and their application to railway work. Ills. 3500 w. Sci Am Sup—Feb. 24, 1906. No. 75087.

Single-Phase Traction on the Borinage Railway. Abstract of a description published by the Allgemeine Elektrizitäts-Gesellschaft. The line runs through a coal-mining district in Belgium. Ills. 1700 w. Tram & Ry Wld—Feb. 8, 1906. No. 75295 B.

The Warren and Jamestown Single-Phase Railway. Illustrated description of this electric line and its equipment. Horizontal gas engines are used as prime

### Single Phase

sources of driving power, and the single-phase alternating current system. 3500 w. R R Gaz—Vol. XL., No. 7. No. 75024.

Traction by Single-Phase Alternating Current at 15,000 Volts (Traction par Courant Alternatif Simple à 15,000 Volts). S. Herzog. Detailed description with illustrations, of single-phase electric locomotive, made by the Oerlikon Works, for the Oerlikon-Wettingen railway, near Zürich. 2500 w. 1 plate. Génie Civil—Feb. 10, 1906. No. 75129 D.

Single-Phase Electric Equipment for the New York Terminal Division of the New York, New Haven & Hartford R. R. Brief illustrated description of the 11,000-volt single-phase electric locomotive for this road. 3000 w. Eng News—March 22, 1906. No. 75655.

Experimental Single-Phase Installations for the Swedish State Railways. Gives a brief illustrated description of the trial equipments for the electric railway experiments in progress. 2000 w. St Ry Jour—March 31, 1906. No. 75873 C.

Single-Phase and Continuous-Current Equipments and Limiting Schedule Speeds. H. M. Hobart. Compares the merits of the two systems pointing out the importance of having ample reserve of capacity for maintaining high accelerating rates in order to obtain the improvement in schedule speed demanded. Diagrams. 2700 w. Tram & Ry Wld—April 5, 1906. No. 76139 B.

Single-Phase Direct-Current Locomotive for the New York, New Haven & Hartford Railroad. An illustrated account of the motor and its construction, with detailed description of this important machine and its operation. Also editorial. 6700 w. St Ry Jour—April 14, 1906. No. 76064 C.

Single-Phase Railway Motors and Methods of Controlling Them. T. H. Schoepf. Abstract of a paper read before the Manchester Local Sec. of the Inst. of Elec Engrs. Short discussion. 1700 w. Elect'n, Lond—March 23, 1906. No. 75902 A.

Single-Phase Locomotives and Motor Cars in Bavaria and Sweden. Frank C. Perkins. Illustrations of the locomotives used, and description of the electrical equipment and other interesting features. 1500 w. Sci Am Sup—May 5, 1906. No. 76501.

Single-Phase Railway for the Milan Exhibition, 1906. E. Fumero. Abstract translation from *L'Electricista*. Gives the chief features of this exhibition installa-



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## Single-Phase

tion, which connects the two sites. Ills. 2000 w. *Elect'n, Lond*—May 11, 1906. No. 76757 A.

The Development of the Westinghouse Company's Single-Phase Railway System. An interesting brief review of the development. 1400 w. *Elec Wld*—April 28, 1906. No. 76593.

The Finzi Single-Phase Railway System (La Ferrovia Monofase Sistema Finzi). A brief description, with sheet of illustrations of the Finzi system of monophase electric traction, as exhibited at Milan. 1200 w. 1 plate. *L'Industria*—April 29, 1906. No. 78177 D.

The Advent of Single-Phase Electric Traction. C. F. Jenkin. Read before the British Assn. Aims to call attention to the rapid advent of electric traction on railways; to explain why electrification is being adopted and its advantages; and to describe the system on which it should be carried out. 8400 w. *Elec Engr, Lond*—Aug. 17, 1906. No. 78840 A.

The Single-Phase Railway at the Milan Exhibition. Illustrated description of the electric railway which runs from the part of the exhibition in the park to the second half in the Piazza d'Armi. 1200 w. *St Ry Jour*—Aug. 11, 1906. No. 78494 C.

The Spokane and Inland Single-Phase Railway. J. B. Ingersoll. Illustrated detailed description of this electric line and its equipment and operation. 2000 w. *Elec Jour*—Aug., 1906. No. 78600.

Report of the International Exposition at Milan (Bericht von der Internationalen Ausstellung zu Mailand). Describing some of the electrical features, with particular reference to the Finzi single-phase railway. 2000 w. *Elektrotech Zeitschr*—Oct. 11, 1906. No. 79961 B.

Single Phase Equipment for the Washington, Baltimore & Annapolis Railway. Information in regard to the equipment of this line, which is one of the largest and most important installations of the single-phase system yet undertaken. 1200 w. *R R Gaz*—Oct. 12, 1906. No. 79750.

Tests and Operation of the Single-Phase Locomotive on the Seebach-Wettingen Railway (Messresultate und Betriebserfahrungen an der Einphasen-Wechselstrom lokomotive mit Kollektormotoren auf der Normalbahnstrecke Seebach-Wettingen). W. Kummer. With curves showing the performance, and a profile of the line. 2500 w. *Schweiz Bauzeitung*—Sept. 29, 1906. No. 79974 B.

The Toledo & Chicago Interurban

## Snow

Single-Phase Railway. John R. Hewett. An illustrated account of the overhead line equipment, controllers and motors of this recently completed railway. 4000 w. *St Ry Jour*—Oct. 13, 1906. No. 79813 C.

The Use of Alternating Current for Heavy Railway Service. B. G. Lamme. A discussion of systems that have been developed, which are applicable to heavy service, considering the merits of the single-phase system with commutator type motors, the cost of such a system, etc. 7500 w. *St Ry Jour*—Jan. 6, 1906. No. 74228 C.

Single-Phase Locomotive for 20,000 Volts (Einphasenlokomotive für 20,000 Volt). Illustration and general description of the locomotive built for the Swedish State Railway. 1800 w. *Elektrotechnik und Maschinenbau*—Jan. 1, 1906. No. 74660 D.

Single-Phase Railway Motors. Friedrich Erichberg. Describes the system of the Allgemeine Elektrizitäts-Gesellschaft, and states some of its advantages. 2400 w. *Elec Engr, Lond*—Dec. 22, 1905. No. 74140 A.

The Stuba Valley Railway. Egon E. Seefehlner, in *Elektrische Bahnen und Betriebe*. Illustrated description of the first line equipped for working with single-phase alternating current of high tension and frequency, which has been in satisfactory operation for 15 months. 3000 w. *Elec Engr., Lond*—Dec. 29, 1905. Serial. 1st part. No. 74285 A.

See also Electrical Engineering, Motors.

## Sleet.

Fighting Sleet on the L. & W. V. R. R. Brief illustrated account of the sleet-fighting equipment as an example of the methods considered best for the third-rail electric road between Scranton and Wilkesbarre, Pa. 1000 w. *Ry & Engng Rev*—March 10, 1906. No. 75474.

## Snow.

Novel Swiss Combination Snow-Plow and Sweeper. Illustrated description of efficient apparatus for the removal of snow. 500 w. *St Ry Jour*—Nov. 4, 1905. No. 73026 C.

Methods of Handling Snow on Electric Railways. Gives particulars as to methods and equipments employed by a number of interurban railways in different parts of the United States. Ills. 4500 w. *Eng News*—July 26, 1906. No. 78234.

The Snow Problem in Marquette. Hamilton Baluss. Illustrates and describes methods of combatting snow when

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the fall is very heavy. 1200 w. St Ry Jour—Feb. 17, 1906. No. 75032 C.

### Starting.

Grid Starting Coils. Henry Schlegel.

A statement of facts about grid coils, explaining their advantages. 3000 w. St Ry Jour—Oct. 6, 1906. No. 79640 C.

### Station.

The Grand Avenue Station of the Consolidated Railway Company at New Haven, Conn. Illustrated description of a plant which is producing power at such low rates as to make a detailed study of the equipment and operation of interest. 2500 w. St Ry Jour—March 3, 1906. No. 75351 C.

Spy Run Generating Station of the Fort Wayne & Wabash Valley Traction Company, Fort Wayne, Ind. Illustrated detailed description of this high-tension generating station and its equipment. 1500 w. Elec Ry Rev—Oct., 1906. No. 79653.

The Central Power Station of the Chicago & Western Indiana Ry. Illustrated description of this station and its equipment, designed to meet unusual requirements for lighting, heating, power, etc. 2500 w. Eng Rec—Oct. 6, 1906. No. 79668.

Commonwealth Electric Company's New Station. An illustrated detailed description of the first steam turbine generating station in Chicago. 4000 w. Ir Age—July 20, 1906. No. 78226.

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The Steep-Grade Electric Railway from Alto to La Paz, Bolivia. J. Pierce-Hope. Abstract of a paper from Pro,

### Sub-Stations

of the Mich. Engng. Soc. Describes an electric road 6 miles long connecting points differing 1390 ft. in level, costing \$70,000 per mile. 900 w. Eng News—Aug. 23, 1906. No. 78695.

### Stray Current.

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construction. 1800 w. Sci Am—Dec. 23, 1905. No. 73984.

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The Loschwitz Suspended Mountain Railway (Die Loschwitzer Berg Schwebebahn). Wolfgang Adolf Müller. A very complete account of an inclined cable railway near Dresden. The cars are suspended from a single overhead rail, and drawn by wire rope, the maxi-

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## Switzerland.

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## Symbols.

Standard Symbols for Electric Railway Plans (Sicherheitsvorschriften für Elektrische Bahnanlagen). A report upon standard symbols by the German Electro-technical Society. 7500 w. Elektrotech Zeitschr—May 17, 1906. No. 76861 B.

## Telpherage.

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Topeka Railway Company. An illustrated description of the roadbed, shops, equipment, generating station and park.

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4000 w. St Ry Rev—Nov. 15, 1905. No. 73209 C.

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The Reconstruction of the Olive Street Track. Richard McCulloch. An illustrated account of track work in St. Louis. 4500 w. Jour Assn of Engng Soc—Aug. 1906. No. 79893 C.

Tramway Track Work. R. C. Bullough. Read before the Munic. Tram. Assn. Discusses important matters concerning present-day tramway track work. 2500 w. Elec Engr, Lond—Sept. 28, 1906. No. 79687 A.

## Train Dispatching.

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## Traffic.

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Way and Way Matters. Reviews the practice of interurban roads with regard to rails, joints, bonds, ties, ballast, turn-outs, crossings, bridges, signals, terminal stations, way stations and miscellaneous way matters. Ills. 9000 w. St Ry Jour—Oct. 13, 1906. (Convention Sec.) No. 79816 C.

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A New System of Electrically Welding Rail-Joints. Brief illustrated description of a method being employed in Germany. A high temperature is secured by the use of a large electric arc. 700 w. March 17, 1906. No. 75577 C.

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### Wheeling, W. Va.

The Wheeling Traction System. An illustrated account of recent extensive

### Wisconsin

work in the elimination of grades and curves by the construction of a cut-off, with particulars of the cost. 5000 w. St Ry Jour—Oct. 13, 1906. No. 79811 C.

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New Wheel-Shop of the New York City Railway Company. States the peculiar conditions which make the wheel problem a matter of great importance in New York, and gives an illustrated description of the new shop and its equipment. 2000 w. St Ry Jour—Nov. 25, 1905. No. 73452 C.

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